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CHEMICAL WEEKLY

VOL. XXXIII APRIL 5, 1988 NO.

8.22

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13 APR 1988
C.F.T.R.I., MYSORE

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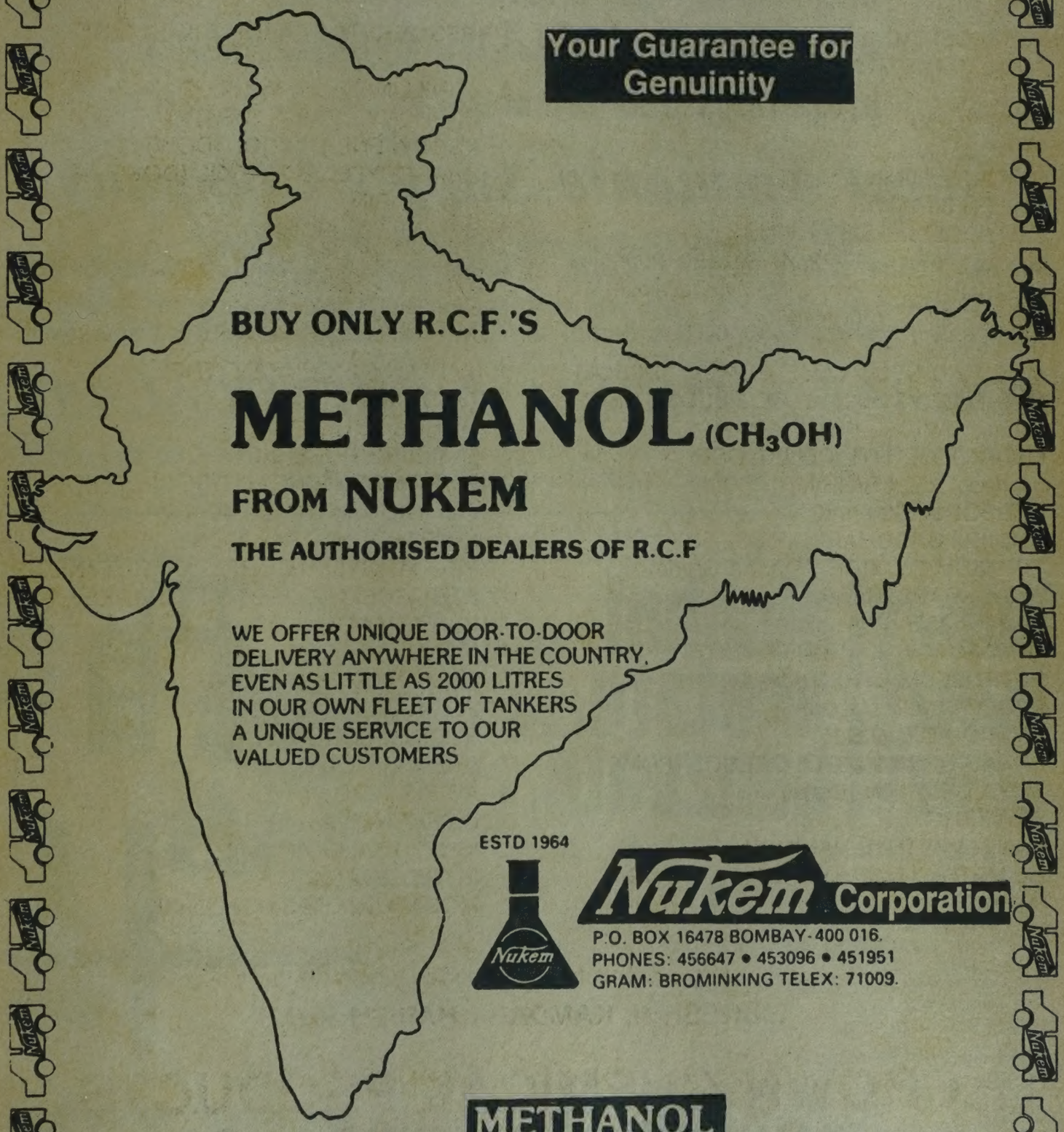
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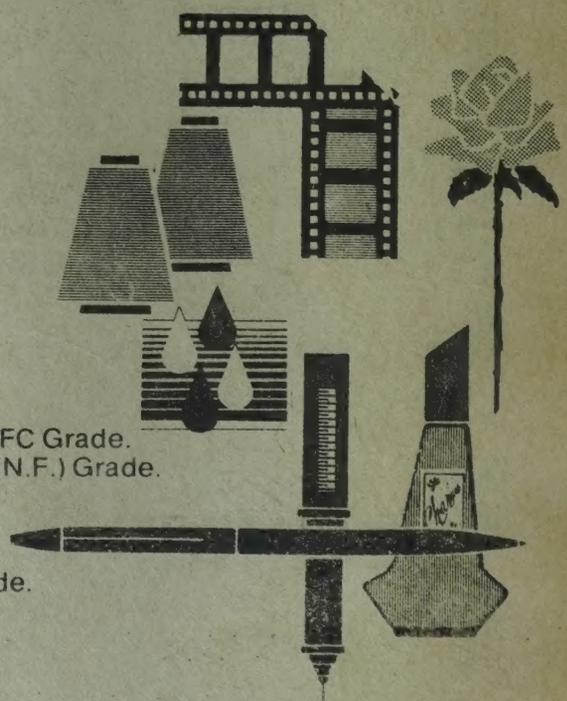
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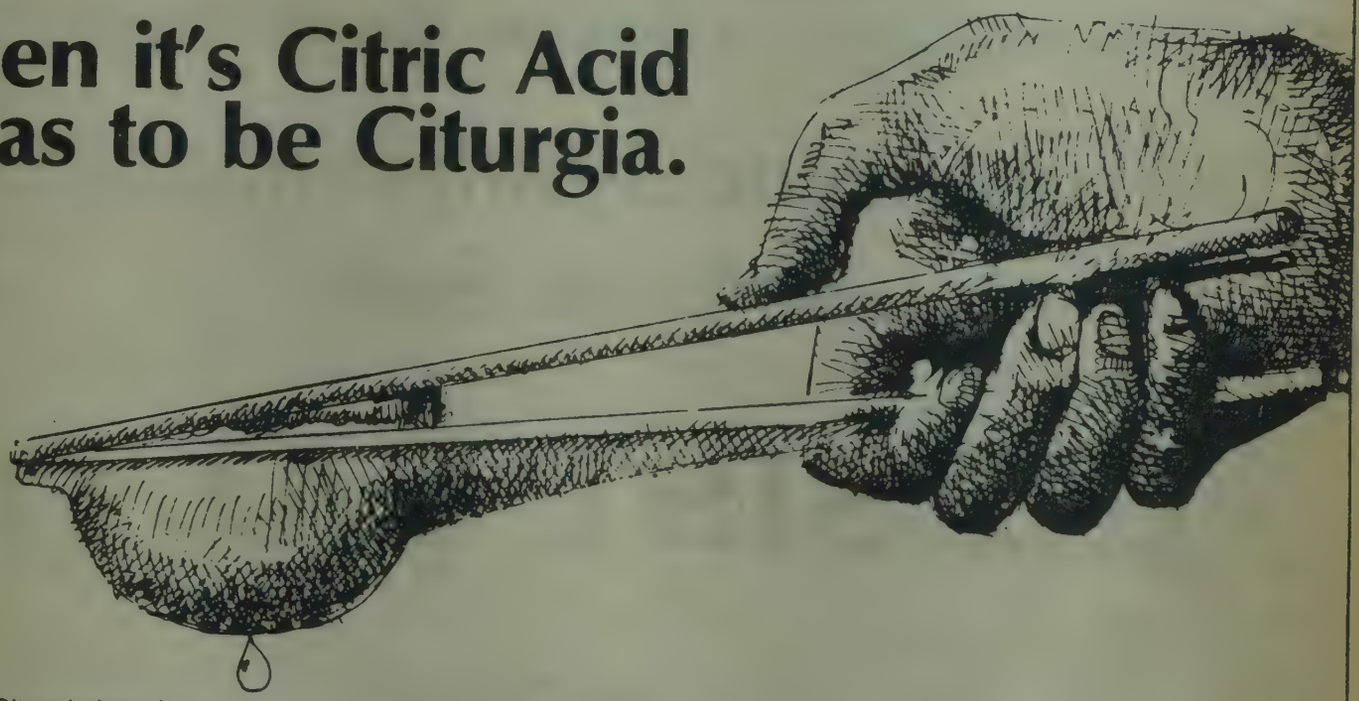
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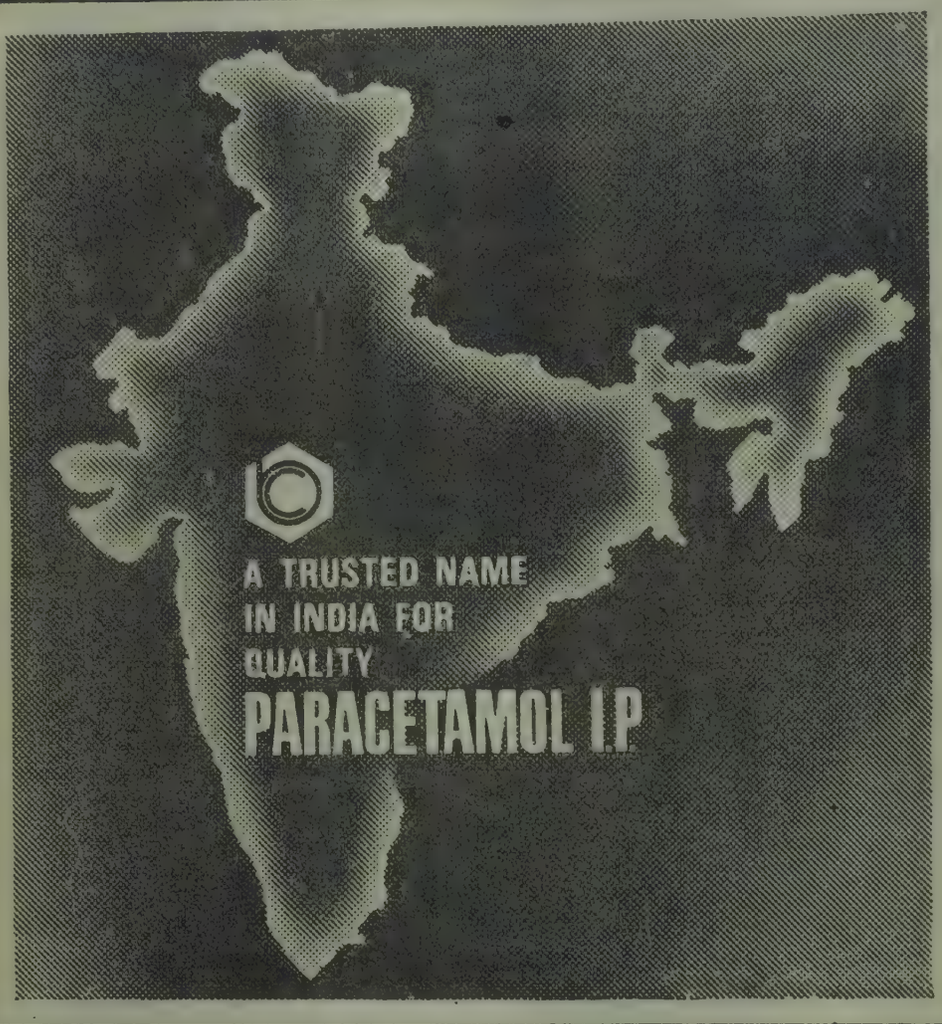
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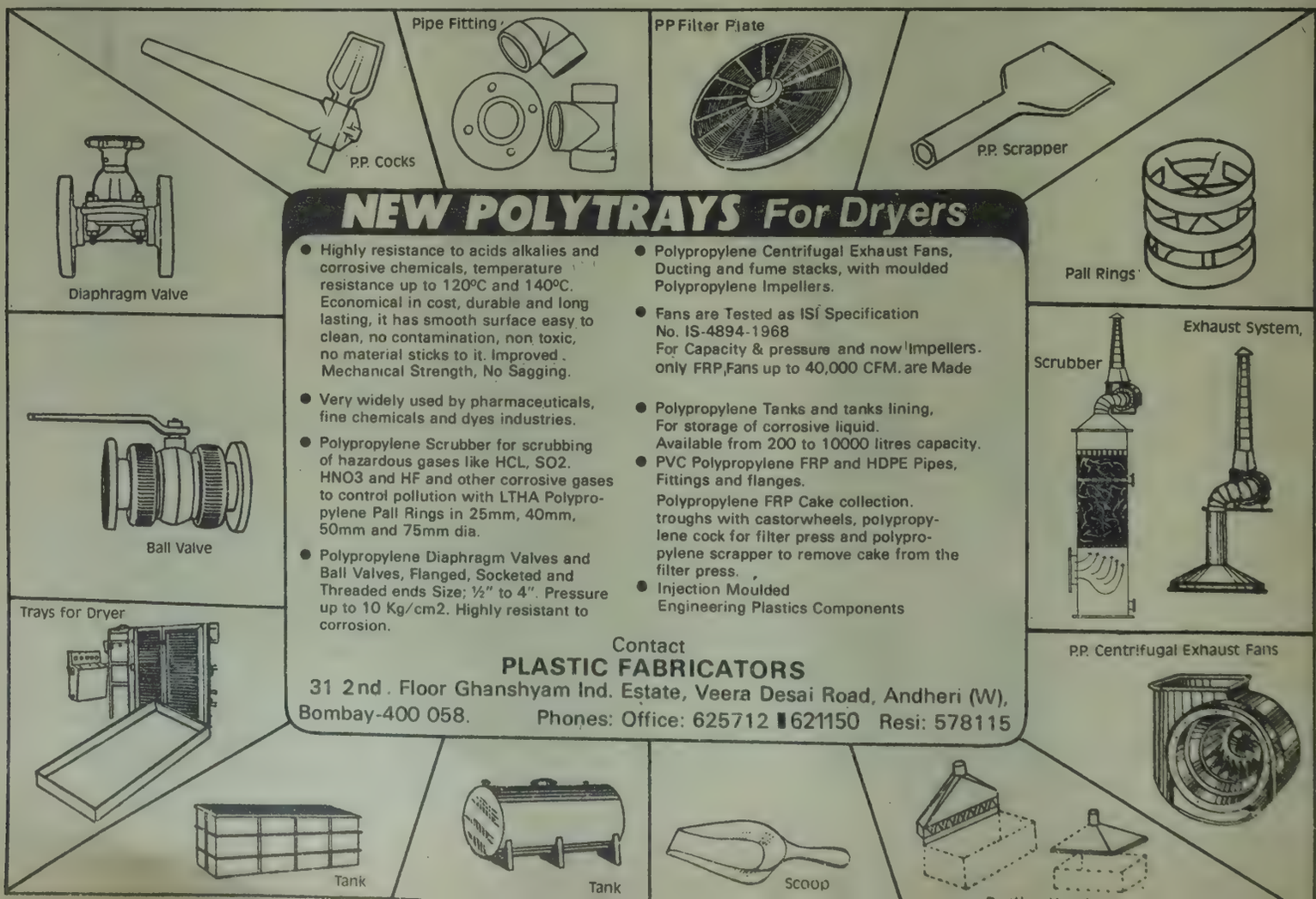
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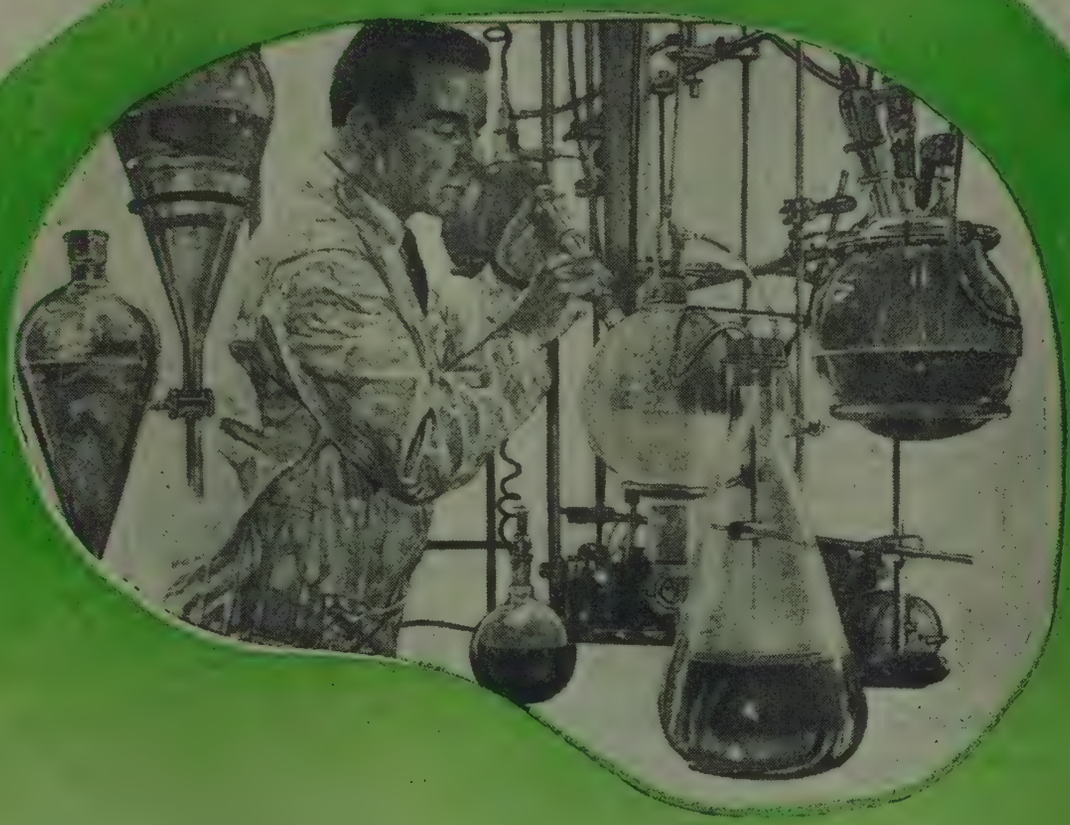
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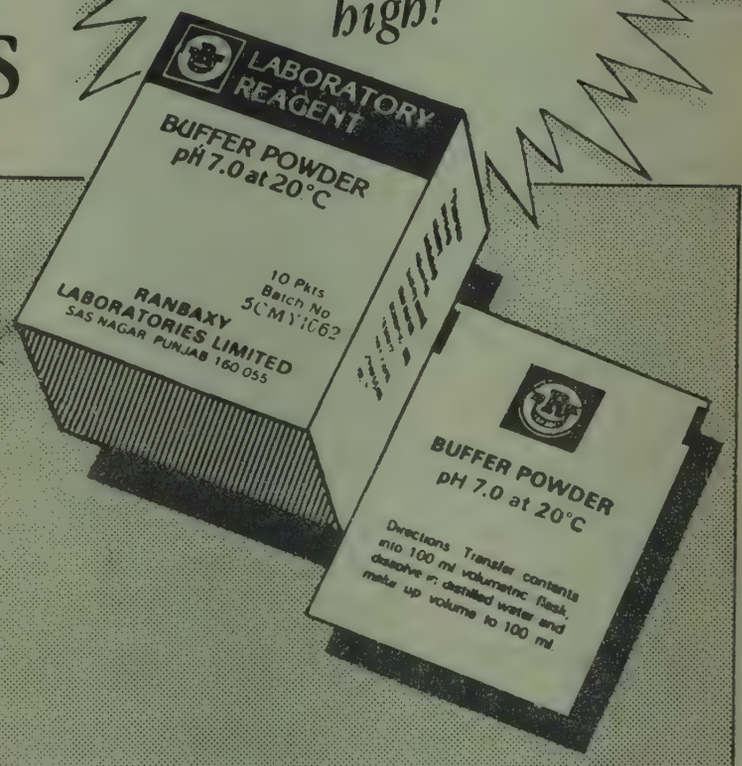
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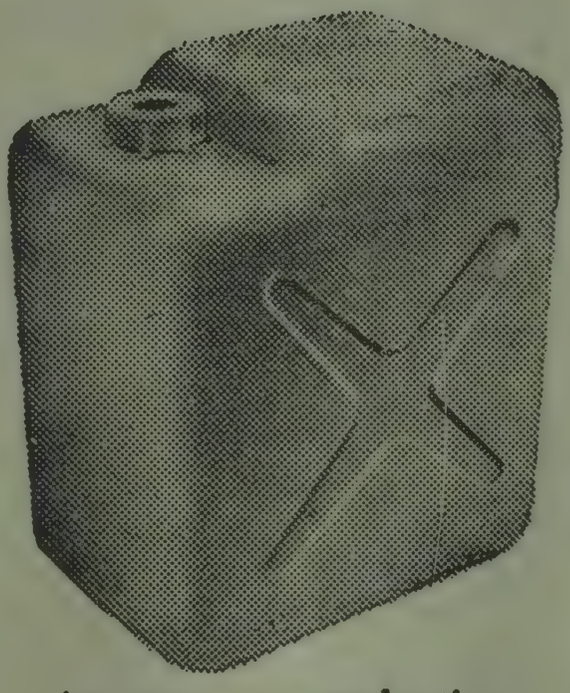
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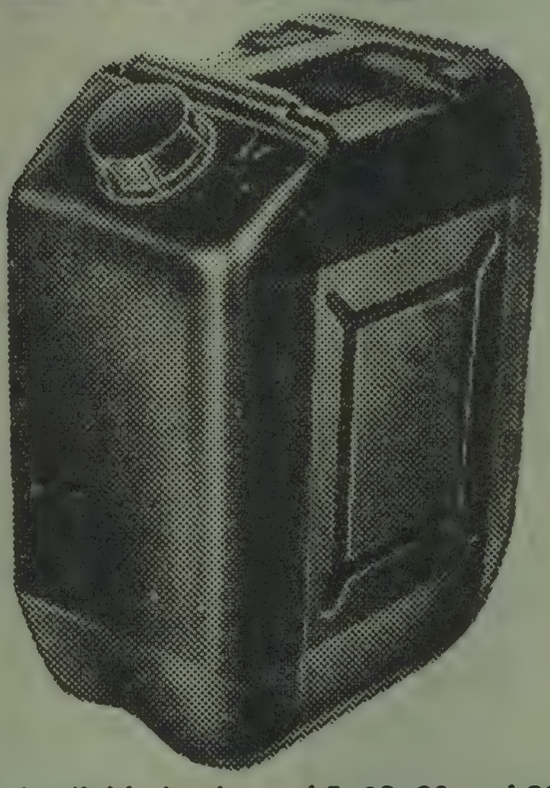
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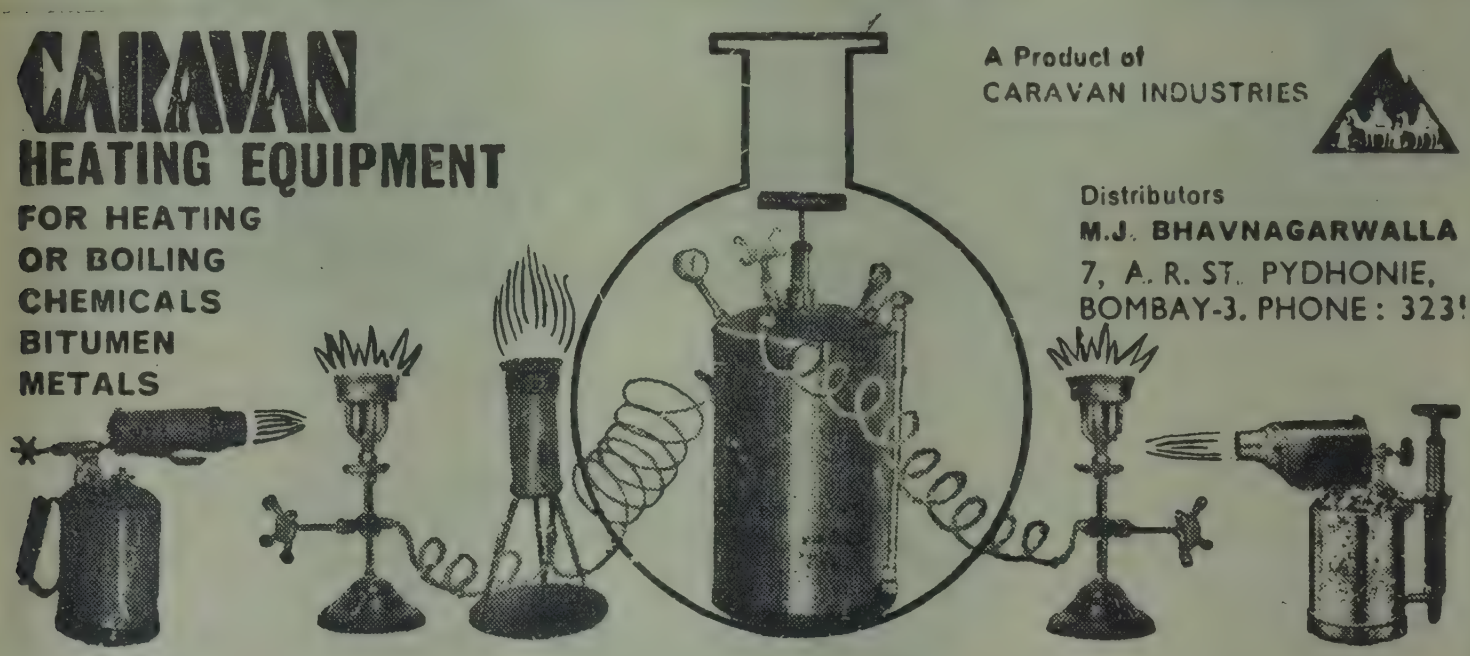
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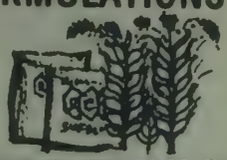
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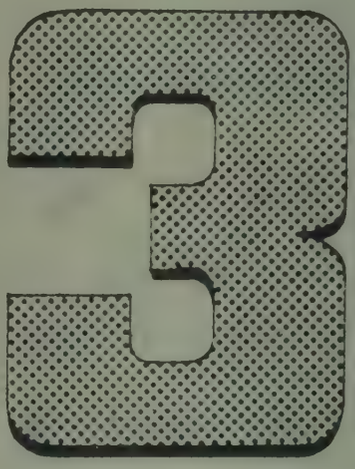
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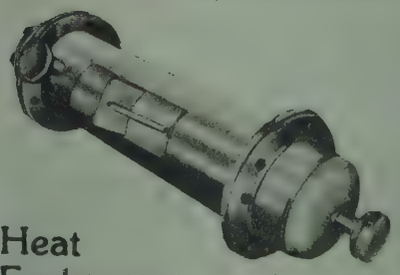
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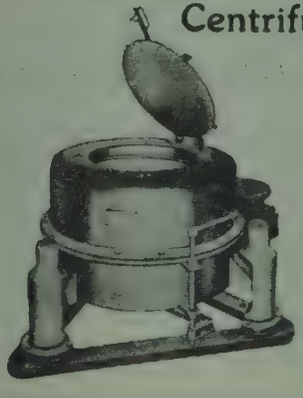
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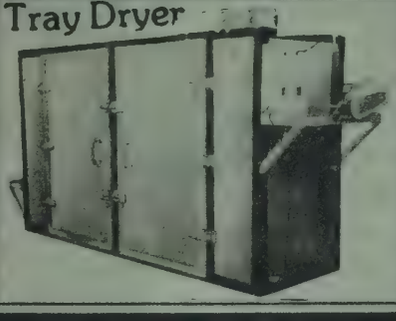

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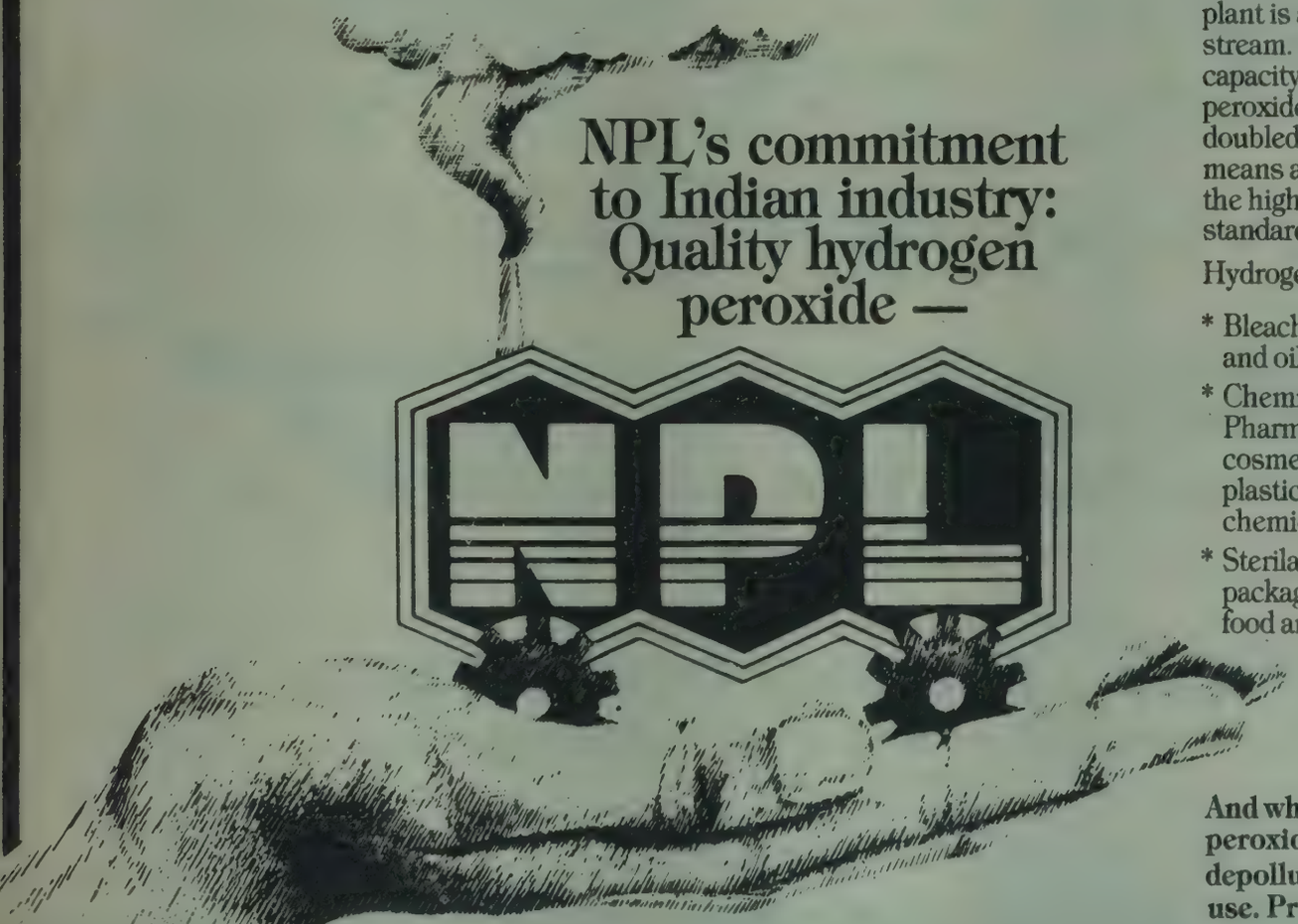
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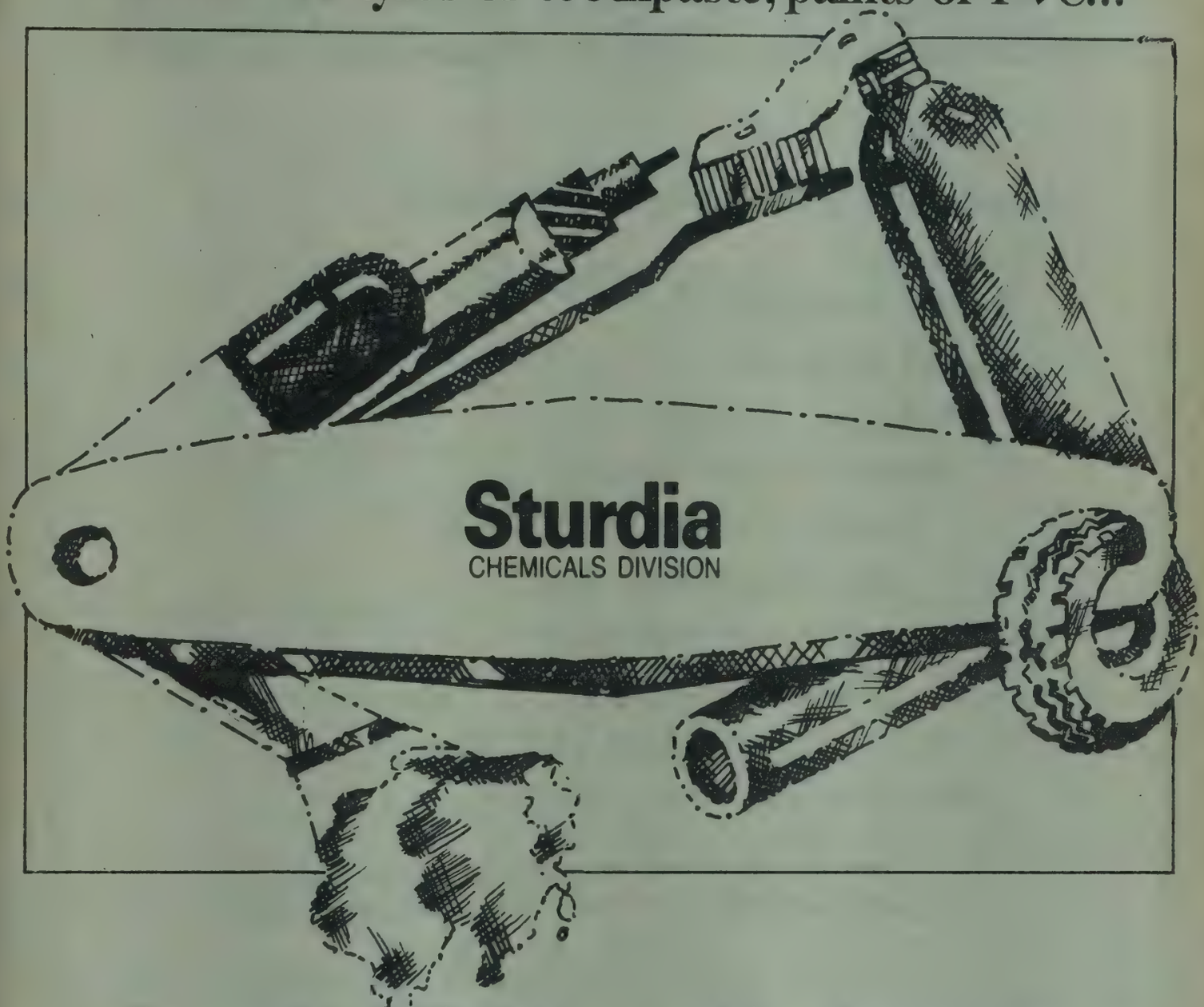
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CHEMICAL WEEKLY

VOL. XXXIII APRIL 5, 1988 NO. 30

Karmarkar's Algorithm

Four years ago in late 1984, Narendra Karmarkar, 28 year old computer scientist from India, astounded the scientific community and the business world with the announcement that he had cracked one of the most difficult problems in linear programming using an algorithm (a step by step mathematical procedure) which he had developed.

This break through is based on Karmarkar's ingenious approach to a branch of mathematics called projective geometry. Previously the best way to reach a solution was a nose to the ground number crunching process. The computer calculated the impact of one variable before moving on to the next. Figuratively speaking, Karmarkar's method takes a bird's eye view allowing the computer to close in steadily on the answer in fewer steps. "The idea is to continuously transform space mathematically so that you are always in the center that one can choose the best direction every step of the way "

Karmarkar said that he had discovered a quick way to solve problems so hideously complicated that they often defy most powerful super computers. Such problems bedevil a broad range of business activities from assessing risk factors in stock portfolios to drawing up production schedules in factories. Similarly a company that distributes products through more than a handful of warehouses can now decide on the vital problems of calculating the cheapest route for getting goods to consumers.

To most mathematicians Karmarkar's precocious feat was difficult to swallow. Complex decisions depending on multiple parameters are common to most industries; so a special branch of mathematics called linear programming has been evolved and most mathematicians thought they had reached the feasible limits to problem solving. It is at this stage, Karmarkar stepped in with his algorithm and staked his claim of having cracked one of the thorniest aspects of computer aided problem solving. When other researchers independently tried to test Karmarkar's process, their results were disappointing or at the most inconclusive. They came to doubt the very veracity of the algorithm and the scientists openly attacked the Karmarkar solution.

Soon it came to be known that other scientists were unable to duplicate or reproduce Karmarkar's work, mainly because, the employers of Karmarkar, AT & T Bell Laboratories, had kept away vital details about the method of translating the algorithm into digital computer code, from the public gaze. This had been purposely done to give Bell Labs a head start at developing a commercial product. The utilisation of the fruits of Karmarkar's work would have meant an instant windfall for many big companies. It could also lead to the development of better software for small companies that use computer to help manage their business.

The concept underlying Karmarkar's work constituted pure research, where the mathematical notations run into 20 printed pages and as such it could not be patented or copyrighted but any computer programmes that AT & T developed to implement the procedure can be patented.

Very soon, it is expected that AT & T may be selling the first product based on Karmarkar's work to the US Air Force. This will include a multiprocessor computer from Alliant Computer Systems Corporation and a software version of Karmarkar's algorithm that has been optimised for high speed parallel processing. This system would be installed to the Air Force Base headquarters of the Military Airlift Command (MAC).

The following example may illustrate the type of problem to which this algorithm can be applied. On a typical day thousands of planes ferry cargo and passengers among the air fields scattered round the world. To keep these jets flying, MAC must juggle the schedules of pilots and other flight personnel. In addition MAC must determine whether it would be more efficient to reduce cargo

and top off the fuel tank at the start of each flight or refuel at stops along the way and pay for the cost of shipping the fuel.

To get, the airplanes back in the air, cargo handlers need to be standing by and ground crews must be ready to serve the aircraft. Even the best laid plans of MAC are likely to be disrupted by bad weather or emergency change in priority. Getting all these parameter to match together is a classic challenge in linear programming. If a computer could wring out just a couple of percentage points of added efficiency, it would be worth millions of dollars.

The success of this computer programme at MAC would virtually guarantee immediate sales in the transportation market. American Airlines are eagerly waiting to put this technique to test.

Karmarkar claims that his algorithm solves such problems 50 to 100 times faster than the present techniques. The airlines wish to determine whether they could have a better way of rewriting the flights due to bad weather. Another major potential saving from this technique would lie in projecting crew assignments weeks in advance. Stephen Clan, head of the transmission facilities planing department at Bells Lab. says that this technique has been put to the test and that its performance is outstripping all expectation. The savings are expected to run in millions.

AT & T is using Karmarkar's formula to forecast the most cost effective way to satisfy future needs of the telephone network linking 20 odd countries situated on the rim of the Pacific oceans. To do this Bells Lab. must estimate current and future telephone demand between every pair of switching points within the network. The resulting computer model involves 42,000 variables. Considering that for many factors are not practicable with the SIMPLEX method which is currently in vogue, it is felt that each question concerning this problem would take four to seven hours of computer time. But in Karmarkar's technique, the answers are available in less than four minutes.

It is difficult to describe how the mathematical concept behind this algorithm works except perhaps by illustrations with examples. The most common analogy is that a linear programme problem resembles a geodesic dome. Each of the dome's corners has a probable solution. The problem is to find out which one holds the best solution. With the simplex system the programme 'lands' in one corner and inspects it. Then it scouts the adjacent corners to see if there is a better answer, if so it heads off in that direction. The procedure has to be repeated out at every corner until the programme finds itself boxed in by worse solutions. Karmarkar's method employs a radically different tactic. It starts from a point within the structure and finds that the solution by taking a short cut that avoids the tedious surface route.

From the interior vantage point, it uses an arcane discipline known as projective geometry to reconfigure the structure's shape, by studying the new structure the programme determines the direction in which the solution lies. Then the problem structure is allowed to return to its original shape and the programme jumps towards the solution, pausing at intervals to repeat the exercise and home in on the answer.

Karmarkar's formula works so well, that AT & T are applying it to problems so complex that nobody has ever bothered to try tackling them as a whole. The company's model of long distance network consists of 800,000 variables; with traditional methods, even a simple question, answering would set a mainframe computer whirring for weeks. But Karmarkar's technique weighs all the variables and spits out answer in less than an hour. The difference between the two approaches showed AT & T how to squeeze an extra 9 to 10% of capacity out of $15 billion system.

All are now convinced that Karmarkar has brought an unusually open mind to linear programming. Fame now seems assured for Narendra Karmarkar. The Algorithm that bears his name is already being included in text books. More researchers now agree that the power unleashed by Karmarkar provides them for the first time with the tools to analyse the total systems that used to be studied piece-meal.

"The Karmarkar Algorithm has enormous potential as an aid to planning facilities and designing routes for extremely complex and costly telecommunication network. The algorithm's speed saves money on processing time on much larger problems that could not be solved by other optimal method," said Mr. Eric E. Summer, Vice President of Bells Labs.

Other major centers of Computer Research such as Cornell University and California, Berkeley are expressing optimism abut this algorithm and have admitted that 'Mental horizons have been opened.' Karmarkar himself, modestly adds that the 'pay offs till now' are only the 'the tip of the Iceberg'.

-- T.P.S. RAJAN

(Source: **Science & Technology** -- *Business Week*, (McGraw Hill, Sept. 87).

CHEMARENA

S.L. VENKITESWARAN

Proctor and Gamble step into India

Proctor & Gamble the biggest in the field of detergents and consumer products in USA who have taken over Richardson-Vicks have now a chance to expand their activities in India through Richardson Hindustan Ltd. The new name is perhaps P & G India-HR Ltd. Being only with 40% foreign equity they have the freedom to expand under more benign regulations of I(D&R) Act as applicable to Indian companies. RH Ltd. is well known for the Vicks brand of balms and throat inhalers with half the market for these and nearly Rs. 50 crores turnover. P&G with world sales of $17 billion may think RH is peanuts but the potential for introducing the well-known brands of detergents like Tide and tooth paste like Crest may be exploited.

It is doubtful if these branded detergents would seriously upset India's cheaper top-spot Nirma but a cut into Hindustan Lever products may be expected if a massive advertisement campaign is taken up. Instant coffee is also a line which could be exploited in India by the producers of Folgers Coffee. Personal care products have also a high growth rate in India.

Polypropylene leads Plastics Demand Growth

Closely following PVC and polyethylene which have reached near capacity levels of production in USA it is the turn of polypropylene. It is reported to be at near 100% capacity utilisation levels and a growth rate of 10% a year -- a jump from the 60% rates of the early eighties in USA and world demand has been growing at high rates. By 1995 the expectations are that PP will be 17% of a global plastics consumption of 76 million tonnes --up from 15% of 52 million in 1985.

The recent thrust is said to be due to newer applications through innovations, particularly in the field of textiles and packaging, as substitute for raffia and jute and metals, wood and paper. There is a substitution element of other polymers particularly of polyethylenes due to the lower density of PP and of polyester also. The major area of use is films and thermoformed materials for packaging products like margarine. Disposable non-wovens and industrial fabrics is another area. PP has a wider range of usage as compared to PVC of which 70% is linked to construction industry.

The consumption of PP in 1987 is figured at:

W. Europe	--	2.8 million tonnes
U.S.A.	--	2.6 "
Japan	--	1.2 "
Others	--	5.5 "

West Europe has an edge over USA in capacity and consumption and Himont, the joint venture of the discoverer company Montedison, with Hercules of USA dominates the field. Himont has pioneered high technology but others have not been far behind, even if Himont technology accounts for 50% of world capacity. Super High Activity Catalysts have eliminated solvents and catalyst removal steps and the latest is a process of Union Carbide based on Shell catalyst -- Unipol PP. Today most producers have switched to third generation high yield catalysts, but India's IPCL is yet to change.

Usage wise the breakup in 1987 out of 2.63 million tonnes was estimated in W. Europe as:

Textiles	30%
Film and Sheet	15%
Packaging	12%
Automotive	11%
Household items and others	8%
Other injection mouldings	13%
Pipe and tubing	4%
Others	7%

China is a big export market and likely to take in 3,90,000 tonnes even in 1995. Fibres for carpet backing is an area of continuing growth. Plans for new capa-

city are afoot but doubts about recession and of propylene supplies persist.

A major development is the new dehydrogenation process likely to be used by SABIC whereby propylene can be made from propane without its being an appendage of ethylene crackers. This process is to be used in a plant in Thailand for a 1,00,000 tonnes polypropylene project. The propane use may need link with refineries but the concept of "complexes" of multi products and intermediates may go into the background. The scale of production is now over 1,00,000 tonnes a year. India has neglected both polypropylene and HD polyethylene in the early years and the total lack of any new projects in the last ten years has resulted in relatively acute shortage and large imports of these now. MGCC has included PP in its product range and Haldia also is switching to it but the question is when it will come. Mathura Refinery's propylene should best be used for PP as there is little scope for a 2nd oxo alcohol plant. Steps are urgently required in India's plans for polypropylene in the coming decade.

Butane based Acetic Acid Plant Explodes

The Celanese plant for acetic acid based as butane oxidation at Pampa, Texas suffered a serious explosion on November 14, 1987 killing 34 and injuring 37. Two blasts were 20 seconds apart and their cause is under investigation. The blasts were near a gas-fired boiler and a nearby reactor. Most of the casualties were through flying blocks and debris and not from any chemical fumes. As the blasts occured on a weekend with far less than the usual compliment of workers, there were only 60 of whom 40 suffered. There was a huge fire which followed the blasts and this was allowed to burn out without attempts at extinction and hence continued for twelve hours. The major problem was the butane storage tanks near the site and efforts centred on keeping them cool under water spray. The fire was fully contained but not controlled in time and acetic acid leaks doused and diluted by water. A major disaster to the neighbourhood was avoided although broken windows and similar effects in the town a few miles away resulted in claims of nearly $20,000.

It is said that the new arrangements for disaster preparation through the Community Awareness and Emergency Response -- CAER -- organised under the aegis of Chemical Manufacturers Association has been extremely helpful. The CAER was started after the Bhopal disaster in India and it is to be made mandatory soon. Fully detailed maps of the huge plant site with layouts, storage tanks, safety features, pipelines etc were available with the public fire service and other agencies. Actually the CAER seems to have had a first exercise of its preparedness when a tornado hit the plants area a year ago. The response by the town's 22,000 population was said to be very positive.

Hoechst who are the new owners of Celanese's chemical operations had a difficult choice on what should be done -- revive a relatively obsolete process for acetic acid from butane (in which Celanese was the pioneer in USA) or go in for the newer more economic process from methanol which is also a Celanese pioneer effort. It is reported that Hoechst-Celanese are to build the butane-based plant and are apparently satisfied on the economics at the site conditions, and the nature and extent of damage. More uptodate controls may be incorporated in the 35 year old plant of 500 million lbs. capacity. The costs of revival are estimated at $100 million, perhaps provided fully by insurance claims.

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Salient features of new import policy

The import and Export Policy for 1988-91 was announced. The major objectives are:

(i) to stimulate industrial growth by providing easy access to essential imported capital goods, raw materials and components to industry and to sustain the movement towards modernisation, technological upgradation and making the industry progressively competitive internationally;

(ii) to promote efficient import substitution and self-rellance;

(iii) to give a fresh impetus to export promotion by improving the quality of incentives and their administration; and

(iv) to simplify and rationalise policy and procedures.

The new Import-Export Policy will have a validity of three years from 1st April, 1988 to 31st March 1991. Open General Licences have also been issued with the validity up to 31st March 1991. However, the licensing shall continue to be on an annual basis.

Capital goods will continue as in the past to be on OGL or licensable if not otherwise restricted. 99 items of industrial machinery have been included in the list of capital goods allowed for import under Open General Licence. These are mainly machinery used in the electronics sector, the silk sector and for the tea industry. Five items of capital goods have been shifted to the Restricted List having regard to their indigenous availability and quality.

The policy provides that where the cost of the new machinery to be imported exceeds Rs. 25 lakhs, an advertisement has to be published in the Indian Trade Journal and Indian Export Bulletin. The new policy provides that the advertisement could also be published in the journal of the Confederation of Engineering Industry. This has been done with a view to minimising the time taken in the publication of the advertisement.

The facility for import of second-hand capital goods which are not more than 7 years old and have a residual life of not less than 5 years has been continued. However, in cases where the value of the second hand machinery proposed to be imported exceeds Rs. 10 lakhs, the intending importers will have to follow the advertisement procedure prescribed for import of new machinery exceeding Rs. 25 lakhs in value. The advertisement in the case of second hand machinery will be for a comparable new machine. This will not be necessary in the case of capital goods which are allowed under Open General Licence.

Special consideration

In order to enable the exporters to become internationally competitive, it has been thought necessary to provide a facility for the import of capital goods to established exporters notwithstanding the indigenous availability of such capital goods. It is proposed to allow manufacturer-exporters exporting 25 per cent of their production subject to a minimum of Rs. 1 crore or units exporting a minimum of Rs. 10 crores, special consideration in the matter of import of capital goods. Such imports would be allowed on the basis of price and delivery considerations notwithstanding the indigenous availability of such capital goods. The capital goods proposed to be imported, should, however, have a direct nexus with the products exported.

The Open General Licence facility will be available for import of computer systems if the import is in one consignment and the computers have a minimum configuration of (a) CPU with a minimum of 32 bit word length; (b) main memory of 16 megabytes, and (c) disc storage capacity of thousand megabytes.

The facility for import of computer systems subject to export obligation under the Software Export Scheme has been continued.

The policy for import of instruments has been rationalised. Instruments given in the Restricted List will not normally be allowed for import. Import of instruments as components or as capital goods will be allowed under supplementary licensing or capital goods licensing procedure as the case may be.

Expanded list

Actual users (industrial) will continue to be eligible to import under Open General Licence, raw materials, components and consumables which are not in the Banned, Restricted, Limited Permissible or Canalised lists. The list of items allowed for import under Open General Licence has been expanded. A number of items which were allowed under Open General Licence to actual user (industrial) in the earlier policy but were not specifically listed in the import policy have been added to the OGL list for the convenience of the actual users. After inclusion of 329 such items, the total number of items of raw materials, components and consumables allowed for import under Open General Licence comes to 944. These items can also be imported by export houses and trading houses against additional licences. Some of the items can be imported by all persons for stock and sale. These are items of the nature required by a large number of actual users and in small quantities.

The facility for import of Restricted and Limited Permissible items by actual users under the supplementary licensing procedure has been continued. Supplementary licences can now be utilised for import of any other item appearing in the Limited Permissible list and required by an actual user upto 10 per cent of the value of the licence upto a maximum of Rs. 20 lakhs within the overall value of the licence.

Repeat operation

The facility for repeat operation of supplementary licences to exporting units has been continued. The repeat operation facility is available only once and the actual user has to follow the supplementary licensing procedure in the following year. This facility is available to units exporting 25 per cent of their production in any of the two previous licensing years subject to a minimum of Rs. 10 lakhs.

The procedure for meeting the requirements of raw materials and components for the capital goods industry manufacturing tailor-made items has been modified to allow 50 per cent of the raw materials/components immediately on receipt of the applications, so that such industries are able to adhere to tight delivery schedules. The balance requirements would be cleared after approval of the appropriate committee.

Actual users will continue to have the facility of importing permissible spares under Open General Licence. They will also be granted licences for import of restricted spares on the basis of the value of the machinery in-

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stalled. The value limit for import of a single item has been raised from Rs. 1.5 lakhs to Rs. 3 lakhs.

After sales service

The facility for import of spares by manufacturers of capital goods for providing after-sales/warranty coverage has been continued. Indian agents of foreign machinery/instrument manufacturers will also continue to be eligible to get licences for import of spares for stock and sale.

A new provision has been introduced for import of spares by consultancy, designing and engineering firms who are implementing turnkey projects. Such firms are presently allowed import of raw materials, components, consumables and capital goods for the implementation of these projects. The import of spares would be allowed on the basis of 2% of the value of imported equipment, plant and machinery or 1% of the total purchase price of the indigenous machinery installed by these firms in the projects set up by them during the 3 previous licensing years.

State Electricity Boards/projects and undertakings engaged in the production and distrbiution of electricity will be eligible to import emergency spares under Open General Licence on the basis of releases of foreign exchange by the Central Electricity Authority or the Ministry of Finance. This facility has also been extended to Departmentally-run-undertakings and Railways.

Canalisation

The items canalised for import through public sector agencies have been reviewed keeping in view the indigenous availability of such items and the objectives sought to be achieved through canalisation. Only those items which are bulkable in nature or where there are a large number of small scale actual users or there are advantages in importing through canalising agencies have been retained in the canalised list. On this basis import of 26 items has been de-canalised.

newly canalised items to the extent of

The facility for direct import of 25% of the past consumption of imported material has been continued.

An enabling provision has been made to allow import of canalised items by trading houses to give them opportunities for promoting exports.

The facility for import of capital goods, raw materials, components, etc. under Open General Licence has been extended to Railways, Departments of Posts & Telecommunications, Doordarshan and All India Radio.

Doordarshan will be eligible for import of exposed films including video films under Open General Licence on the basis of approval of the Ministry of Information & Broadcasting.

These organisations will continue to have the facility for import of their requirements of capital goods, raw materials, components, consumables and spares (excluding consumer goods) under Open General Licence.

Actual user (non-industrial)

Other categories of actual users (non-industrial) will continue to be eligible for import of capital goods, raw materials, components, consumables and spares.

Workshops engaged in the repairs of machinery and equipment and vehicles will be eligible to apply for grant of licences for import of spares.

The new import policy containes a provision for grant of licences to consumer electronics service centres for import of spares.

Facilities for non-resident Indians

Non-resident Indians/persons of Indian origin will continue to have special facilities in the matter of import of capital goods, raw materials, components and consumables required for the purpose of setting up of an industrial unit or participation in expansion/diversification of an existing unit in conformity with the industrial policy of the Government. Non-resident Indians can import capital goods which are in the Open General Licence list. They can import under Open General Licence other capital goods which are not restricted for import upto a landed cost of Rs. 35 lakhs.

Import of raw materials in the first year will be under Open General Licence subject to clearance by the Special Approvals Committee in the Ministry of Industry. In the second and third years applications are to be made to the Chief Controller of Imports & Exports direct for grant of all licences without requiring them to route their application through the sponsoring authority.

They will also have import facility for setting up amusement parks.

In all cases, import is to be financed out of the non-resident Indian's own foreign exchange earnings/resources abroad and no remittance from India will be allowed. Neither the capital invested nor the profits thereof shall be allowed to be repatriated abroad.

The condition of permanent return of the non-resident Indian for availing of the special facilities has been dispensed with.

Life saving drugs

The provisions regarding import of drugs and medicines have been reviewed so as to ensure easy availability of life saving drugs and equipment. 209 items of life saving equipment and 108 items of life saving drugs have been put under Open General Licence for import by all persons. The value limit for import of drugs and medicines by hospitals or medical institutions has been enhanced from Rs. 25,000 to Rs. 50,000. The value limits for import of drugs and medicines by individuals and by medical practitioners have been raised from Rs. 1,000 and Rs. 5,000 to Rs. 2,000 and Rs. 10,000 respectively.

Hospitals and radiological clinics will be eligible to import X-ray intensifying screens upto Rs. 1 lakh as against Rs. 50,000 in the earlier policy.

In the case of medical instruments and equipment, the value Limits for import by hospitals or medical institutions and by registered medical practitioners have been raised from the existing Rs. 2 lakhs and Rs. 5,000 to Rs. 4 lakhs and Rs. 10,000 respectively.

The facility for import of office machines will be available to exporters having an export performance of Rs. 1 crore and above. Import will be allowed once in two years.

Export houses/trading houses will be eligible to get a licence every year for import of office machines. They will also have the facility for import of PABX/PBX on the recommendation of the Dept of Telecommunications.

Import policy provides for grant of licences to public sector undertakings and export houses/trading houses for bulk import of raw materials and components for distribution to actual users. The value of licences to export houses/trading houses has been enhanced from Rs. 50 lakhs and Rs. 1 crore to Rs. 1 crore and Rs. 2 crores respectively.

(Contd. on Col. 3, p.44).

One window clearance for 'hazardous' units

The State Governments on March 29 unanimously recommended that the examination of applications for initial location or expansion of factories involving a hazardous process should be examined under a 'one window' concept. The site appraisal committee envisaged under the Factories' Act for this purpose must have the Chief Inspector of Factories as chairman and other experts competent to approve the project in all respects.

The meeting of State Labour Secretaries held under the chairmanship of Mr. Badal Roy, Union Labour Secretary, further suggested that before the conversion of the letter of intent into an industrial licence, the committee must once again examine that all safety controls have been fully installed.

The other major area covered relate to safety audit and preparation of on-site and off-site emergency and disaster control plans. Most of the States have taken up the work of identification of hazardous units. However, most of these did not require preparation of on-site and off-site emergency plans.

It was mentioned at the meeting that most State Governments had designated the collectors of the districts as the district emergency authority on the basis of a model sent to them by the Union Government. A programme is being designed to appraise them on the management of chemical emergency.

Under the scheme for streng thening of industrial hygiene laboratories, a sum of Rs. 36 lakhs will be spent during 1988-89 for supplying equipment to make them self-contained and be able to undertake environmental monitoring effectively.

It was also pointed out that there is still a shortfall in the number of safety officers to be appointed under the law. The vacancies must be filled at the earliest to ensure compliance of the provisions and safety committees be formed in factories engaged in hazardous processes and dangerous operations and processes.

GAS CRACKER PROJECT OKAYED

The Project Approvals Board has cleared the Rs. 700-crore Gujarat gas cracker to be set up by the Reliance Industries, it is reliably understood.

According to indications available in New Delhi the World Bank has shown interest in meeting the foreign exchange requirement of the Gujarat cracker, including some of the downstream units. The total cost of the project is estimated at around Rs. 1,500 crores. The foreign exchange requirement is approximately 25 per cent of the total cost.

The Gujarat cracker will have a total capacity of 300,000 tonnes of ethylene, 150,000 tonnes of high-density polyethylene, 100,000 tonnes of PVC and 50,000 tonnes of MEG. The Reliance Industries had been given the letter of intent for HDPE, PVC and MEG in 1985.

Of the total ethylene to be produced at this project, Reliance has been authorised to use 160,000 tonnes, while the remaining 140,000 tonnes will be shared by the GSFC, the GNFC, Mafatlal and Grasim.

To execute this project, the Reliance Industries has set up a separate company — Reliance Petrochemicals Ltd.

PESTICIDE TRANSFER TO OGL FLAYED

The transfer of 15 technical grade pesticides from the banned list to open general licence (OGL) backed by a reduction in customs duty from 105 per cent to 70 per cent has put the domestic pesticides industry in a spot.

According to chairman of Pesticides Association of India Salil Singhoi, 13 of the 15 technical grade pesticides now under OGL are being manufactured indigenously. The industry fears that under the new dispensation, import of these pesticides will surge leading to unfair competition and sickness in the industry.

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Higher notional credit scheme to be continued

The Government is to continue a higher notional credit scheme when the MODVAT (Modified Value added Tax) scheme ends on March 31.

The Minister of State for Revenue, Mr. Ajit Kumar Panja, said the extent of higher notional credit under the new scheme would be five percentage points. He told Mr. D. C. Prashant (Ind) that a notification would be issued shortly making the scheme effective from April 1.

He told Mr. Kapil Verma (Cong.-I) that concessions up to Rs. 2,700 crores were expected to be availed of in the current financial year under MODVAT. A total of Rs. 2,259 crores, out of a total revenue of Rs. 8,589 crores, had already been availed of between April 1987 and January this year.

Mr. Panja told Mr. Nirmal Chatterjee (CPI-M) that reports had been received from places like Nagpur, Ahmedabad and Jaipur about misuse of the MODVAT scheme by splitting the small-scale units, setting up of dummy small-scale units, and incorrect disclosure of input-output ratios.

The government was contemplating a study to determine the actual benefit of the MODVAT scheme to the consumer, he added.

The scheme was to have expired in September last but was allowed to continue till March 31 on receipt of representations. It had been started with the clear objective of reducing the cascading effect of excise duty on inputs on finished products.

The following are points from replies given by official spokespersons in Parliament.

Not feasible :

As the quantum of natural gas now available in Cauvery and Krishna-Godavari basins in the Southern region was very small, it was not found feasible to lay an HBJ-like gas pipeline in the region at present.

High-tech development :

A technology development and information company is to be set up in search and development schemes. The Technology Development and Information Company of India Limited (TDICI) would also finance venture capital for high-tech and high-risk projects, technology upgradation and modernisation schemes and provide technology information service on a commercial basis for users.

Oil exploration :

The Government and the Oil and Natural Gas Commission signed on February 19 last a contract with BHP Petroleum (India) Inc. for exploration of hydrocarbons in the KK-OS-VI block in the Kerala offshore basin. The foreign oil company was required to start the operations within six months. The production of crude between April 1987, and February 1988 was 18.35 million tonnes against a targetted production of 18.20 million tonnes.

MORE WELLS TO BE DUG IN KRISHNA-GODAVARI BASIN

The Oil and Natural Gas Commission (ONGC) plans to dig two more wells adjoining the fifth well in the GS-16 structure in the Krishna-Godavari basin where oil and associated gas has been found. The three wells already dug (GS-16 II, IV and VIII) have all indicated adequate oil reserves and are capable of producing the maximum quantity. Oil from these wells has been sent to the refineries in Visakhapatnam and Madras for testing. Commercial production is likely to begin towards the end of the current year, official sources said in Madras on March 29.

The total prognosticated oil and oil equivalent gas reserves in India are estimated to be 16.6 billion tonnes. Crude production will be stepped up to 144 million tonnes in the current Plan.

Interconnections : About nine more wells are planned including GS-16 VI and VII which would all be interconnected to form an effective oil reservoir. This would contribute to increased production through Early Production Systems (EPS) ONGC

A tetrapod (smalll platform with a helipad and connected to the main offshore rig, D. K. Mackintosh, through a walk up bridge), is being set up. A floating pipeline will run below the bridge and be connected to the offshore platform. The main offshore rig is a mat-supported self-elevating drilling unit designed for water depths of 80-85 metres of mat and leg below the hull. The rig is capable of drilling up to nearly 7000 metres. This particular rig has been certified by the U.S. Coast Guard and the American Bureau of Shipping as Al self-elevating offshore drilling unit. There would be two pipeline from the offshore platform to the mother tanker supported by a single buoy system (SBS) and a floating pipeline from the tetrapod through the main offshore platform to the mother tanker. From the mother tanker, a shuttle tanker ship will carry the crude for refining to Madras and Visakhapatnam.

Later a process platform which would be bigger than the tetrapod will be set up for separating gas from crude oil. The gas would be brought to the nearest land point at Surusanyanam, near Amalapuram.

Conservative estimate : On an average all these wells are capable of yielding 2000-2500 barrels a day. The estimated one million tonnes a year of oil is a very conservative one. Official circles admit the potential to be anywhere between two million and 2.5 million tonnes in the whole structure which would be covered by over a dozen wells during the next two years.

ONGC started drilling the first well, the GS-16 I in 1984, but gave up its efforts due to technical problems. Officials explain that unlike the Bombay Offshore Project, the sea around the structure off Amalapuram is very rough and the undercurrents are very fast. They can destabilise even established platforms. Special tubular structures have to be imported to erect platforms which would not be disturbed by fast underwater currents.

So far the amounts spent in the Krishna-Godavari basin is Rs. 663 crores, the Cauvery basin Rs. 260 cro-

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IRS to undertake research projects in Malaysia, Libya

The Institute of Reservoir Studies (IRS) of the Oil and Natural Gas Commission has received proposals from Malaysia and Libya for undertaking research projects there.

It may be recalled that the Institute has already carried such research projects in Iraq. During the Sixth Plan, IRS had carried out 392 developmental projects at a cost of Rs. 16 crores in the country which otherwise would have cost ONGC Rs. 80 crores through engaging a foreign consultancy.

Studies carried out by IRS have resulted in an additional production potential of oil and oil equivalent of gas of 6.7 million tonnes per annum from the new fields and another 2.65 million tonnes from already producing fields. Besides these achievements in the first two years of the Seventh Plan, IRS has saved Rs. 40 crores for ONGC through elimination of external agencies in its development projects.

IRS has identified thrust areas in maximising oil recovery and optimising production from already producing fields. Bombay High, Heera, Ankleshwar, Kalol, Santhal, Lakwa and Rudrasagar are some of the fields where additional production has been generated through 'reservoir stimulation studies'.

The Institute has also prepared schemes for early production systems and initial exploitation of fields like R-9, B-131 in Bombay offshore, Vasna basin and Baramura in Tripura.

CAPEXIL PLAN TO BOOST EXPORTS

The Chemicals and Allied Products Export Promotion Counlil (CAPEXIL) has drawn up an action plan to achieve annual export growth ranging between 18 per cent and 20 per cent. The export targets for 1988-89 and 1989-90 are fixed at Rs. 480 crores and Rs. 560 crores, respectively.

For the third time CAPEXIL has bagged the national export award. This year the certificate of merit awarded by the Union Government relates to the 1984-85 performance. The council's membership at present stands at 2100.

From Rs. 16.4 crores in 1958-59 CAPEXIL's exports moved up to Rs. 284.2 crores in 1984-85. Despite various constraints notwithstanding the council's exports in 1986-87 stood at Rs. 361 crores.

HALDIA PROJECT CLEARED

The Union Government has given "all clearances" to the Haldia Petrochemicals complex in West Bengal by the centre.

It is now for the West Bengal Government and the joint sponsors, Goenkas, to implement the project. Mr. Rao said.

Mr. Rao was replying during the question hour, to Mr. A. K. Saha and and Mr. Hannan Mollah, who wanted to know why the Centre had not cleared the project for seven years and wondered whether the delay was for political reasons.

Answering the main question, Mr. Rao said a final decision on the applications for setting up a petrochemicals complex in Gujarat will be taken after issues like availability of feedstock and tieup of resources were resolved.

IPCL'S R&D PLANT

The Indian Petrochemicals Corporation Limited proposed to set up the research and development pilot plant and associated product applications development facilities for carbon fibre based on know-how from R. K. Textiles and Composite Fibres Ltd., U.K., at its Baroda complex at an estimated cost of Rs. 31 crores with a foreign exchange component of Rs. 13.23 crores.

The total number of industrial licences issued for backward areas dropped from 427 in 1985 to 192 in 1987.

While some West German car manufacturers were exploring the possibility of sourcing automobile parts from India, no concrete proposals had so far been received by the government.

CRUDE OIL IMPORTS

A quantity of 9.9 million tonnes of crude oil worth Rs. 1267.13 crores was contracted for purchase and actually imported on term contract during 1986-87.

During the same period, a quantity of 5.9 million tonnes of crude oil worth Rs. 760 crores was purchased on spot markets, deputy petroleum minister. Rafique Alam said in a written reply.

Mr. Alam said the term contracts are resorted to for long-term security of supplies and also for obtaining crude oils generally not available in spot market.

KERALA OFFSHORE EXPLORATION

The Government and the Oil and Natural Gas Commission (ONGC) signed on February 19 last a contract with BHP Petroleum (India) Inc. for exploration of hydrocarbons in the KK-OS-VI block in the Kerala offshore.

The Deputy Minister for Petroleum and Natural Gas, Mr. Rafique Alam, said in a written reply that the foreign oil company is required to start the operations within six months.

The Deputy Minister said in reply to another question that the production of crude between April 1987, and February 1988 was 18.35 million tonnes against a targeted production of 18.20 million tonnes.

(Contd. from p. 40).

Video equipment : The facility for import of video professional equipment for generation of video software for broadcasting purposes has been continued. Import will be allowed on the basis of approval by the Ministry of Information & Broadcasting.

The facility for import of cameras by accredited cameramen and accredited correspondents of foreign broadcasting and television organisation of foreign news agency or foreign newspaper has been continued.

The policy for import of dry fruits by persons engaged in this trade in the past will continue subject to the modification that from the second year of the Policy the eligible importers will have to show export performance to the extent of 50% of the value of the licence in 1989-90 and to the extent of 100% of the value of the licence in 1990-91.

A separate chapter has been incorporated in the Import Policy enumerating the facilities available to small scale units for meeting their requirements of imported capital goods, raw materials, components, consumables and spares.

CATEGORY II ESSENTIAL DRUGS.

Most units outside price control

Drug price control on many of the essential drug formulations appears to have been virtually ineffective with a wider exemption now granted to small drug units from price control in the 1987 DPCO.

The government has exempted from price control all drug units manufacturing formulations based on category II drugs but having an investment upto Rs. 35 lakhs in plant and machinery.

Of 5,000 drug units in the country at present only about 200 are large units and the rest are either small or medium-scale units which contribute 60 per cent of the total drug output. This means a large number of drug units would be outside price control.

According to informed sources, the prices of several hundreds of essential drug formulations listed in category II are thus being hiked by the small drug units. These include many of the antibiotics, vitamins and quite a few other essential drugs.

Earlier, exemption from price control was given to small drug units on the basis of turnover. Only units with an annual turnover upto Rs. 50 lakhs were eligible for exemption from price control in the 1979 DPCO.

This had brought about a total control on most of the essential and life-saving drugs marketed in the country as most of the small drug companies had an annual turnover exceeding Rs. 50 lakhs.

A direct consequence of this change of approach in exempting the drug units from price control is that a number of established medium and small-scale units would be now outside price control.

These include many drug units with even Rs. five crores turnover and above. The cost of plant and machinery of many of these units is well below the exemption limit.

The government has however stipulated drug formulations market by the small drug units should be under their own brand names and not under the trade marks and brand names of other companies for getting exemption from price control.

The sources point out that exempting drug units from price control on the basis of investment in plant and machinery may ultimately defeat the purpose of price control on essential drugs.

PLEA TO EXEMPT ESSENTIAL DRUGS FROM EXCISE DUTY

The Indian Drug Manufacturers Association (IDMA) has urged the Centre to exempt life-saving drugs from the excise duty proposed in the new Budget.

Mr. Vinoobhai U. Shah, President of IDMA, told newsmen in Madras recently that it was shocking that the new Budget sought to levy excise on 26 drugs, which were declared life-saving and consumed by patients for a sustained and longer period of treatment. These drugs were hitherto exempted from excise.

In all, excise duty is levied on about 140 drugs which were decleared as "essential drugs" by the Ajit Kalkar Committee.

He called upon the Government to reduce excise and other taxes on some medicines to the tune of 48 per cent.

Mr. Shah noted that the new drug policy has adversely affected all the small-scale drug manufacturing industries and 8,000 loan licensing units in the country. He warned that wiping out of the loan licensing units, which produces 10 per cent of the total drugs manufactured in the country, will leave nearly 3.25 lakh people jobless.

Besides, the policy recommendation for cancellation licences of the manufacturers, who failed to set up house testing laboratories, will hit a number of small-scale units. Hundreds of such units have already been served with closure notices.

Referring to spurious drugs, Mr. Shah said they could be checked only if the Government appointed a competent body to streamline the issuance of licences. He alleged that 20 per cent of licences were being issued to unauthorised units. He denied that loan licensing units were responsible for the outflow of spurious drugs.

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H-B-J phase II inaugurated

The second phase of the Hazira-Bijaipur-Jagdishpur (HBJ) gas pipeline has become operational with the commissioning of the 580-km long pipeline supplying gas to the Indian Fertilisers and Farmers Cooperative (IFFCO) plant at Aonla, 40 km from Bareilly.

The Aonla terminal and the supply of gas was formally inaugurated by the Union Minister for Petroleum and Natural Gas Mr. Brahm Dutt on March 24th.

With the completion of the second phase, 1200 km of the 1750-km-long H-B-J pipeline have been completed. It will supply about 1.7 million cubic metres of gas to IFFCO each day.

Speaking on the occasion, Mr. Brahm Dutt said while at present the country produced 30 million cubic metres of gas a day it is expected to go up to 40 million cubic metres by the end of the Seventh Plan.

The described the pipeline, which is the longest underground pipeline in the world and is constructed by a consortium of French and Japanese experts, as a "union of three cultures."

Mr. Brahm Dutt said efforts are also on to extend the pipeline up to Delhi.

The Union Agriculture Minister, Mr. Bhajan Lal, who also was present said India did not produce enough fertilisers to meet the requirements of the entire country.

India needs one crore tonnes of fertilisers a year but produced only 72 lakh tonnes. "The rest is imported," he said.

"With the completion of the H-B-J pipeline, the problem would be solved to a great extent," he added.

Among those present at the function were the Deputy Minister for Petroleum and Natural Gas, Mr. Rafiq Alam, the French Ambassador in India, Mr. Antre Lewin, and the Japanese energy Minister.

Six plants are designated to be set up along the route of the pipeline. Out of this, four will be at Aonla, Shahjahanpur, Jagdishpur and Babrala. The gas will reach the other fertiliser plant at Jagdishpur in May. Although work on Babrala and Shahjahanpur projects has been delayed, gas has been earmarked for these.

After the completion of the fertiliser plants three million tonnes of urea would be produced in the State.

The pipeline will also supply gas to two more fertiliser plants in Rajasthan and Madhya Pradesh.

The second phase of the pipeline (580 km) was completed within six months which is an international record.

The first phase from Hazira to Bijaipur, covering a distance of more than 640 km, was commissioned in August 1987 with the supply of gas to the National Fertilisers Ltd (NFL).

With the completion of the two phases, about 1200 km of the 1750 km long pipeline have been "tested and commissioned without a single mishap."

The 1750-km-long pipeline, passing through four States, has a capacity of 18.2 million cubic metres of gas a day.

ONGC ADOPTS NEW MANAGERIAL TOOL

The Oil and Natural Gas Commission, one of the biggest business houses, employing over 45,000 people, has set a new trend among the public-sector undertakings by adopting a novel management technique.

The ONGC has constituted a "chairman's advisory council on management and corporate policies" to evolve suitable policies for optimum level of performance.

The corporate policy of the ONGC is governed by a number of internal and external factors and to have proper managerial control the policy should be constantly monitored and reviewed. The advisory council has been formed to achieve this objective, according to Col. S. P. Wahi, chairman, ONGC.

The advisory council will have eminent men drawn from different walks of life with a distinguished record of service and achievement. The council will include management experts from the private and public sector, civil servants and labour leaders.

The ONGC would have the benefit of the experience of the panel of experts while chalking out its long-term plans and operations. A number of experts have already been sounded and the composition of the advisory council will be announced shortly.

The ONGC would be able to demystify some of the misconceptions regarding its operations by its interaction with a panel of experts, while at the same time its decisions would have been vetted by a variety of public interests, thereby eliminating the influence of vested interests.

The concept of advisory council gained currency following the success of two similar councils set up earlier by the ONGC for "exploration strategy" and "human resources development".

The advisory council on exploration strategy has been set up to make recommendations on the corrections to be made in the existing norms, methods and technologies. In this council, ONGC's geoscientists interact with eminent oil technologists. **(More oil News appears elsewhere in this issue).**

EXPORT AWARDS LEVER, JAYSYNTH, COLOUR-CHEM

Under the national export awards scheme, instituted by the Government, 22 firms have been selected for the award of trophy and 28 firms and organisations for certificates of merit for their outstanding performance during 1983-84 and 1984-85. The awards were presented by the President, Mr. R. Venkataraman at a formal function to be held at New Delhi on 26 March.

The award winners for 1984-85 include Associated Cement Companies, the Century Spinning and Manufacturing Co, Hindustan Lever Ltd, Hoechst India Ltd, Ingersoll Rand (India) Ltd, Modi Rubber Ltd, Synthite Industrial Chemicals Pvt Ltd, Tata Consultancy Services and Vijay Associates.

The winners of certificate of merit for 1983-84 include Century Spinning and Manufacturing Co. Ltd, Colour Chem Ltd, Eastmen Industries, Hoechst India Ltd, Jaysynth Dyechem Pvt. Ltd, Kajaria Castings Pvt Ltd, Trilochem Products Pvt Ltd, and Triveni Engineering Works Ltd.

For the year 1984-85 certificates of merit will be presented to Ajay Industrial Corporation, Dr. Beck and Co (India) Ltd, Chemicals and Allied Products Export Promotion Council, Eupharma Laboratories, G. Ampherey Laboratories, India Gelatine and Chemicals Ltd.

World facing 3 major environmental crises

Dr. Rashmi Mayur, noted environmentalist and director of the Bombay-based Urban Development Institute, feels that unless steps on war-footing are taken the world is facing three major environmental crises.

In an interview with UNI, he outlined the three as the carbon dioxide problem, acid rain and the ozone layer.

Dr. Mayur said he was not a prophet of doomsday but worried that 700 million people were affected by hunger mostly in the poor. Third World and predicted that this year there would be 80 million more people on the earth.

He lamented the fact that 17 million hectares of forest were destroyed last year and eleven million hectares of forests were being cut down every year.

Dr. Mayur, dealing with the problem of carbon dioxide, said the world as a whole had not recognised the seriousness of the crisis. He said carbon dioxide was a product of the massive use of fossil fuels and it has just two sinks, one the forests and the other the ocean.

He said that 50 per cent of the world's forests had disappeared, mostly in the last 100 years ago. Thus the absorption of carbon dioxide was slowly declining.

Dr. Mayur noted that if ocean exploration and mining begins and if that affects the marine life then the situation will totally aggravate as the sink would be lost.

He was of the opinion that if the present situation continued without being accelerated by further environmental degradation, then by the year 2030 major climatic changes around the world will take place.

Dr. Mayur said that one of the great changes to be dealt with immediately was the drying up of the world's grain bowls. Dr. Mayur explained with the help of on-the-spot drawings and diagrams that how countries further from the equator with lower rainfalls will become 'the dry lands'. The United States, Canada, the Soviet Union and China — all major producers of food either for their own or the world's markets — would be severely hit, he adds.

He further said 20 million hectares of forests should be planted annually to arrest the present destruction and begin to replace the carbon dioxide sink. He has appealed to governments all over the world to protect the forest area immediately, particularly the rain-forests.

He said that at this rate carbon dioxide in the air was increasing by 4.5 per cent a year and at this rate global temperature will rise three to four degrees centigrade by 2030 and north America, the bread basket of the world, will dry up. Massive flooding will occur in other parts of the world because of the meltdown of the Arctic ice sheet.

He said that the acid rain problem was a global problem one which might not be that serious in India but will eventually affect the world as a whole.

Dr. Mayur said the most significant steps so far in attempts to reduce the impact on the ozone layer was the Montreal Treaty signed by 27 countries last year.

He said that in India no major efforts have been mounted against the use of CFC (chlorofluorocarbons) used as propellent in most aerosol sprays and present in the refrigerant used to cool air-conditioners.

S. M. DATTA : NEW ICMA CHIEF

Mr. S. M. Datta, Senior Vice-President of Hindustan Lever Ltd., has been elected President of the Indian Chemical Manufacturers Association for the current year.

Fifty-two-year old Mr. Datta is a Chartered Engineer. He also holds a masters degree in Science (Tech.). He has had extensive experience in manufacture of chemicals and is associated with a number of industry associations, says a Hindustan Lever press release.

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PESTICIDE POISONING:

7.5 lakhs affected world over

Two-thirds of the 14,000 cases of deaths due to pesticide poisoning occur in developing countries like India and every year some 7.5 lakh people the world over suffer the ill-effects of such poisoning, according to a paper presented at the national workshop on "pesticide residues in food" which concluded in Ahmedabad recently.

According to a study on DDT residues in human fat undertaken in a few select countries, the DDT content in fat residues was the highest at 27 parts per million (PPM) in India as compared to just 2.5 PPM in the UK.

Residues of DDT and other toxic insecticides were found not only in fat and blood, but also in breast milk of subjects surveyed in various parts of India.

Pesticides like DDT and organochlorine insecticides, which retain their toxicity even after a lapse of many years, pose a great danger to humans and animals.

These pesticides accumulate in the bodies of consumers and reach the apex of the food chain, man, and severely hamper reproduction capacity and also lead to birth defects and health problems for generating to come, the paper said.

In a poor country like ours, use of DDT and BHC, banned in developed countries, continues. Poor farmers use empty pesticide containers to store drinking water or even food with deadly consequences, the paper said, citing the example of the death of six children in Bhuj taluka of Kutch district in April 1986, when empty pesticide drums were used for storing in palmolein oil distributed through fair prices shops.

Intensive sales promotion campaigns by pesticide making firms and ignorance of farmers resulted in the extensive use of insecticides by farmers. The consumption of pesticides shot up to 58,950 tonnes in 1978 from a mere 23,150 tonnes in 1970, it said.

Pesticides mostly cause slow but irreversible damage. They cause cander in subjects of animal experiments though the link between cancer in humans and exposure to pesticides is yet to be definitely established, the paper said.

Organo-chlorines, organo-phosphates and methyl carbinates affect the nervous system while organo-chlorines also adversely affect the liver and kidneys. Nitrophenols upset the heat regulating ability, causing the body to overheat, it said.

SM DYECHEM'S NEW CHEMICALS UNIT OPENED

The joint project of Schimmer and Schwarz GmbH of West Germany and S. M. Dyechem Ltd., for making a wide range of industrial speciality chemicals, at Mulshi taluka, in Pune district was inaugurated recently by Mr. N. D. Tiwari, Union Finance Minister.

This project, with an investment of Rs. 2.50 crores, will make a wide range of basic chemicals and formulations that are currently being imported, and will cater to a wide range of industries, including several core industries.

Speaking at the inauguration, the Chairman Mr. S. M. Shetty, said that on full implementation of the project, the total impact of the company's activities on the nation's foreign exchange reserves would be of the order of Rs. 25 crores a year.

Dr. Eberhard Schwarz, whose company has manufacturing facilities on four continents, and whose products are sold in 60 countries, was present at the inauguration function.

Dr. Schwarz said that a similar project would cost the equivalent of Rs. 10-12 crores in Europe. Explaining that the relatively low cost of the Indian project is due, in no small measure, to the technical and organisational capabilities of S. M. Dyechem, he emphasised that his company's association with S. M. Dyechem is a long-term one.

It covered not merely the transfer of the best technology currently available, but aslo continuing transfer of the latest technologies and developments. It will also help in the establishment of R and D application development facilities in India.

In fact, the two companies have plans to convert the project into a joint venture, with 40 per cent equity participation by Dr. Schwarz's company.

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NEWS DIGEST

Tailor-made pesticides designed

A new type of fast acting insecticide will soon home onto its target without polluting the environment. Scientists at the UK Institute of Virology (IOV) in Oxford have taken a virus of a caterpillar pest and used it to produce an improved virus insecticide by genetic engineering.

This and other naturally occurring viruses have long been used in agriculture and forestry as specific and environmentally acceptable insecticides in many parts of the world, but until now have been slower to work than man-made chemical insecticides.

Now the aim of the new research programme at Oxford is to improve the speed of action of the viral insecticides while maintaining their non-polluting character and specificity.

As the starting point, the scientists genetically "tagged" the virus (akin to ringing a bird in a colony). In 1986, after laboratory studies and obtaining the necessary approval from government departments, Professor David Bishop, the Institute Director, used the tagged virus to infect caterpillars that were then used in a filled experiment.

The objective was to demonstrate the persistence in the environment of tagged virus that was released from the infected caterpillars. This was measured and the site disinfected and prepared for re-use.

The data from the first study provided the baseline for the second phase of the work, that of making a virus insecticide that could not persist in the environment. This was achieved in 1987 by removing from the virus the gene that provides its protective coat.

The resulting "crippled" or "naked" virus was used to demonstrate that the virus always self-destructed in the environment after killing infected caterpillars. Again the field work was undertaken after laboratory tests confirmed the properties of the virus and after the appropriate approvals were obtained.

In the final stage of the work, under development for testing later this year, this deliberately "crippled" virus will be the carrier for a toxin which will quickly and specifically kill the pest before the virus self-destructs, leaving no pollution in the environment.

Professor Bishop sees the engineered virus as the first step towards a new industry producing tailor-made pesticides that quickly home onto specific pests and spare all other insects and organisms in the environment.

BOMBAY HIGH RESERVES

The balance reserves of crude oil in Bombay offshore, including the South Bassein fields, may last only for another 16 years at the current rate of production.

The balance recoverable reserves of crude oil in Bombay offshore, including the South Bassein fields, are about 330 million tonnes, the Deputy Minister for Petroleum, Dr. Rafique Alam, told the House.

The current annual production of oil from Bombay High is a little over 20 million tonnes.

The recoverable reserves of oil in the Cauvery Basin were only 6.4 million tonnes as on July last, he said in a written answer.

FERTILISER STOCKS

About 3.29 million tonnes of fertilisers (NPK) was lying in stock as on March one last, the Minister of State for Fertilisers, Mr. R. Prabhu, said.

The Minister said in a written reply that of this, 2.6 million tonnes was nitrogen, 410,000 tonnes phosphorous and 200,000 tonnes potash.

The estimated production during April, 1987, to March, 1988 was nitrogen 5.4 million tonnes and phosphorous 1.5 million tonnes. Besides, 156,000 tonnes of nitrogen and 739,000 tonnes of potash were imported between April, 1987, and February 1988.

The Minister said the per hectare consumption of fertilisers in 1986-87

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Duty exemption for research units

Government of India has issued a notification No. 321/87 Cus. dated 22nd September, 1987 which allows duty exemption to consumables upto a limit of Rs. 2 lakhs in one financial year when imported by Research Institutions registered with DSIR or by any Universities. In terms of the condition No. 1 of the above notification all the importing Institutions/University who wish to avail the above benefit should apply in writing for registration to the Asstt. Collector of the dealing Group in the proforma given below prior to importation.

1. The Name and address of the Importing Institution/University.
2. Description of goods and their value/quantity.
3. Registration No. of Research Institution and the authority where the Institution has been registered as Research Institution alongwith copy of approved research programme.
4. Name of the Supplier and Country of origin.
5. Name of the Port where the goods are intended to be imported in India.

After their application is registered at the Custom House they will be informed of the full registration particulars. At the time of filing of Bills of Entry these registration particulars should be indicated on the Bills of Entry by the Institution/University.

MATHURA REFINERY TO MEASURE POLLUTION

The Mathura Refinery has started an experimental farming project to study the impact of the water from its effluent on crops in the area.

Chief general manager of the refinery N. L. Majumdar said the project would explore the effect of processed effluent on crops grown in the area.

Under the plan, the effluent, chemically processed at another plant, would be used as fertiliser on crops grown in small plots.

Local people, assisted by agricultural scientists from the Aligarh Muslim University (AMU) cultivate wheat, pulses and vegetables in the direct...

AWARDS FOR SCIENTISTS

Dr. Shankar Dayal Sharma gave away the Ranbaxy research awards for 1986 to four Indian scientists for their outstanding contributions to medical and pharmaceutical sciences.

The awardees are : Dr. C. L. Pathak, emeritus medical scientist of the Indian Council of Medical Research, Dr. A. K. Susheela of the All India Institute of Medical Sciences, Dr. R. C. Srivastava of the Birla Institute of Technology and Sciences and Dr. K. B. Mathur of the Central Drug Research Institute.

The Ranbaxy award for outstanding research in medical and pharmaceutical sciences is accompanied by a cash prize of Rs. 50,000.

Earlier, speaking at the function, the minister of state for science and technology Mr. K. R. Narayanan said the private sector has a great role to play in not only research and development but also in providing incentives to researchers.

He said awards like the Ranbaxy research awards would help give incentives for research and honour scientists in society.

Professor C. L. Pathak, former head of the department of physiology at the SN medical college, Jodhpur, received the award for his work on Mammalian and human hearts and mechanisms of drug actions.

Dr. A. K. Susheela associate professor at the AIIMS, department of anatomy received the award for her work on flourosis and its effects on the skeletal muscles.

Dr. R. C. Srivastava gets the award for his research on the "liquid-membrane phenomenon" in the action of drugs and Dr. K. B. Mathur, assistant-director at the CDRI received the award for his contribution to the design and synthesis of peptides of biological importance.

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New plant for alcohol based Chemicals to be set up

Hon'ble Bapusaneb Prabhugaonkar, Minister of State for Industries, Maharashtra, laid on 5.3.88, the foundation stone for a large scale chemicals project, to be put up by Pentokey Organy (India) Pvt. Ltd. in the backward area of Lote-Parshuram (near Chipiun), Taluka Khed, Dist. Ratnagiri, Maharashtra.

The company has a letter of intent to manufacture from ethanol & methanol, the following Chemicals

1. Acetaldehyde
2. Acetic Acid
3. Ethyl Acetate
4. n-Butyl Acetate
5. Acetic Anhydride
6. Pentaerythritol
7. Formaldehyde
8. Formic Acid
9. Sodium Formate

In the first phase of the project, only the alcohol based chemicals, namely, Acetaldehyde, Acetic Acid, Ethyl Acetate, n-Butyl Acetate and Acetic Anhydride, are proposed to be manufactured. The technology to manufacture these chemicals will be given by, "IBI Chematur (Engg. & Consultancy) Ltd.", a subsidiary of "Nobel Chematur" of Sweden. The rest of the chemicals will be taken up for manufacture, in a phased manner. The company has future plans to manufacture 4000 MTPA of n-Butanol at the same site. The entire project when completed, will bring considerable development to the backward area of khed Taluka.

Mr. Rajendra V. Shah (proprietor, Paintex Chemical Corporation & Director, Deep Jyotee Paints & Chemicals Pvt. Ltd.,) is the Chief Promoter, Chairman and Managing Director of the company.

SOVIET REPUBLICS OFFER JT VENTURES

The Soviet republics of Azerbaijan and Uzbekistan have directly offered to enter into joint ventures with Indian companies in various fields.

Azerbaijan, an oil-rich state, wants co-production for leather haberdashery products, paints, dyes and pigments and various types of home air-conditioners, according to a release of the India-USSR Chamber of Commerce and Industry.

Uzbekistan, which is one of the four Soviet Central Asian republics and rich in mineral resources, has invited Indian companies to participate in chemical, pharmaceutital, leather and shoe production, perfume and cosmestics production and manufacture of cables, machinery, cigarettes and silk.

Some of the other areas for co-operation include improvement of the present equipment and technology of natural silk production and processing and production of mobile compressor stations for civil engineering and road building.

The president of the India-USSR Chamber of Commerce and Industry Mr. Manubhai Shah, has welcomed the offers from the two republics.

SOVIET SCIENTIFIC TEAM COMING

Meanwhile, a high-level Soviet scientists delegation is arriving recently to attended the meeting of the Indo Soviet council for implementation and co-ordination of the bilateral long-term programme in the field of science and technology.

The joint council, which will hold its meeting from March 28 till April 2, will have wide-ranging discussion on the implementation and co-ordination of various programmes envisaged in the long-term scientific programme.

The Soviet delegation, led by the president of the USSR Academy of Sciences, Mr. Guri Marchuk, includes the deputy minister for health of the USSR, Prof I. N. Denisov, academician A. M. Prokhorov (Nobel Prize winner), academician E. P. Velikhov and academician O.M. Belotserkovsky, director, Institute of Computer Aided Design, USSR Academy of Sciences.

During their week-long stay in Delhi, the delegation is expected to have wide-ranging discussions with the Indian scientific community on matters of mutual interest.

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GENETIC ENGG CENTRE:

India, Unido sign agreement

India and Unido have signed an agreement, project document and trust fund agreement in Vienna to establish an International Centre for Genetic Engineering and Biotechnology (ICGEB) in New Delhi. These agreements enunciate the basic terms and conditions for establishing the centre.

The principal function of New Delhi Centre will be to serve as catalyst for the development of Third World countries in the field of biotechnology and genetic engineering related to agriculture, human health and animal productivity. The Government of India will provide funds to the extent of Rs. 20 crores for setting up of INGEB, New Delhi component, according to an official release.

The programmes of ICGEB will commence in the facilities already provided at the National Institute of Immunology and Jawaharlal Nehru University. As soon as the permanent building for ICGEB centre is ready, the whole infrastructural facilities would move to the new building.

Prof. I. C. Gunzalus, an eminent biotechnologist will be the director of ICGEB. Prof. K. K. Tiwari, renowned plant molecular biologist, presently at the University of California, the US, has been appointed head of the New Delhi centre.

The INGEB is an international organisation being set up by 40 member-countries including India as a centre of excellence devoted to the application of genetic engineering and biotechnology to accelerate economic development, especially in developing countries.

The second centre of ICGEB is being established at Trieste, Italy. The ICGEB in addition to two major New Delhi and Trieste centres would have a net work of national regional and international co-operating centres which would promote active programmes of research and development towards fulfilling the country's objectives.

NANGAL UNIT

The Nangal unit of National Fertilisers Ltd., achieved a record ammonia production of 227.318 tonnes in the past 11 months exceeding the highest so far produced during the same period. Ammonia plant, including methanol plant, is poised to achieve capacity utilisation of about 90 per cent during the year 1987-88.

Nangal unit also established new records by achieving the highest daily production of ammonia and nitric acid, (921 tonnes of ammonia and 597 tonnes of nitric acid)

In the 11 months ending February 29, it produced 223 656 tonnes of CAN and 273,074 tonnes of urea as against 200,071 tonnes of CAN and 261,700 tonnes of urea in the corresponding period last year.

This year it is also poised to achieve the highest ever urea production by reaching a capacity utilisation of 91.7 per cent.

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GAS-BASED POWER PROJECTS :

Nine proposals under study

The Union government is examining nine proposals from different states for setting up gas-based power plants with a cumulative capacity of about 3000 mw. The proposals have been submitted by Assam, Madhya Pradesh, Gujarat, Haryana and Andhra Pradesh to the Central Electricity Authority (CEA).

The projects include a 360 mw gas-based thermal station in Assam, a 3100 mw project in Gwalior, three mobile gas turbine sets at Yenuguvanilanka (AP), 123 mw combined cycle power plant at Utran, Gujarat, 99 mw simultaneous cycle gas based power station at Balol, Kalol and Ankleswar (Gujarat), 600 mw combined cycle station based on Gandhar field gas, Bharuch, Gujarat, 750 mw gas-based combined cycle power project in south Saurashtra near Pipavav, Gujarat, and a 216 mw project at Ballabhgarh, Haryana.

According to information available in New Delhi these proposals would be appraised after the availability of all inputs, including gas and water, is confirmed. It is learnt that another project of about 500 mw in the Central sector is also being considered, this time in Tripura.

For the Eighth Plan, according to information available, the Union government has approved the following gas based plants for commissioning: Kathalgun (Assam, under Neepco) 270 mw, Naraspur-Razole in Andhra Pradesh 333 mw, and the Lakwa gas project phase three in Assam 415 mw.

Similarly, a combined cycle gas based power project (600 mw) is proposed to be set up in the Central sector at Dadri, UP. In addition, a gas turbine project at Okhia (Tripura) has been given techno-economic clearance by the CEA. Investment decision on this is now awaited.

Incidentally, during the Seventh Plan period, the total gas-based power plant capacity proposed and established is around 1635 mw. This includes the three NTPC projects at Anta (Rajasthan), Auraiya (UP) and Kawas (Gujarat).

For the present, there are about six gas-based power plants in opration in Gujarat, Maharashtra, Assam and Tripura with a total installed capacity of 900 mw.

The utilisation of gas for production of power has been supplimented by the inception of the combined cycle gas turbine generation technology which has the advantage of boosting thermal efficiency. Sources in New Delhi explain that the efficiency could even go up by 50 per cent, over the conventional methods of using gas in thermal power generation.

While the gas based power projects along the HBJ pipeline are aimed at utilising the gas from the western offshore (for meeting the power needs in the concerned regions), a similar proposal for tapping the available gas in the north east is also being planned.

At present gas is being supplied to the state electricity boards (SEBs) in Assam (1.3 million cubic metres a day), Tripura (0.13 mcmd), Maharashtra (3 mcmd including Tata electric company) and Gujarat (0.35 mcmd).

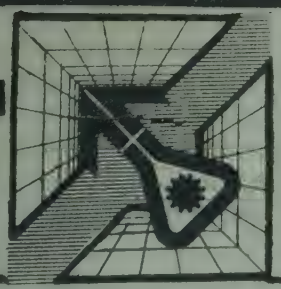
Commitments have been made for supply of gas to the power stations along the HBJ pipeline (4mcmd), Neepco's power project at Kathalguri (one mcmd), the APSEB (0.04 mcmd) TNSEB (0.04 mcmd) and the Rajasthan Electricity Board (0.05 mcmd).

Additional commitments of one mcmd to Tripura and 0.45 mcmd to Gujarat and fall back commitment of 2.25 mcmd for NTPC's plant at Kawas and of 4 mcmd for the Maharashtra SEB have also been made. Therefore, gas worth 11.36 mcmd has been committee for power generation on a firm basis while 6.25 mcmd is on a fall back basis.

Incidentally, gas production in 1986-87 stood at 27 mcmd of which 5.5 mcmd was used for power generation. It is expected that by the end of the Seventh Plan production of natural gas would go up to about 40-45 mcmd. By the end of the Eighth Plan, it is anticipated, production could be raised to atleast 60-70 mcmd.

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New superconducting compound discovered

A physicist has reported the discovery of a new superconducting compound that he believes may work at minus 73 Celsius, potentially setting a temperature record for superconductivity.

The compound, made of lanthanum, copper and oxygen, forms crystal structures that are relatively pure examples of the basic copper-oxygen lattice found in all the new superconductors, said Stuart Wolf, who reported the development along with colleagues from the US Naval Research Laboratory.

Because of their relative purity they may be able to attain superconductivity at higher temperatures than other materials, he said on March 23.

The substance can be made only at temperatures of 1,482 and at pressures 65,000 times those of the atmosphere. But it can then be cooled and studied at normal temperatures and pressures, he said.

Allen Hermann of the University of Arkansas reported that he has achieved superconductivity at a temperature of minus 147.7 with a superconductor he discovered late last year.

IBM scientists were the first to push Mr. Hermann's new superconductor to that temperature, even before Mr. Hermann himself could do it, demonstrating how rapidly research is spreading and advancing.

When Mr. Hermann and his Arkansas collaborator, Zhengzhi Sheng, announced the discovery of the material, "within two days we had confirmation around the world," he said.

For physicists, who are accustomed to working in exotic realms, minus 147.7 Celsius is warm. Previous superconductors had operated at no higher than minus 250 Celsius.

Many physicists are optimistic that the temperatures will continue to climb.

The latest batch of reports came at an unscheduled session held on March 22, during a meeting of the American Physical Society.

The meeting was convened by researchers eager to swap their latest findings.

Fears that the new superconductors would be unable to carry currents large enough for practical applications have

It now has been shown that the materials are potentially capable of carrying huge amounts of current, and researchers reported that they have devised ways of making them that bring them closer to their theoretical current-carrying capacity.

The theoretical physicists still are trying to figure out how the new superconductors work, but the availability now of four distinct superconductors has made some aspects of their operation clear.

All the superconductors include sheets of copper and oxygen, suggesting that these sheets are critical. Furthermore, the materials that operate at higher temperatures have these copper oxide sheets, as they're called, layered in twos and threes.

Physicists are trying to make compounds with the copper oxide layers grouped in fours, on the hunch that those materials will have even higher operating temperatures.

RUBBER GOODS INDUSTRY WOES

Faced with the situation of inadequate supplies of rubber and its high price on the one hand and the failure of buffer stock scheme on the other, the Indian rubber goods industry is once again facing a critical situation.

The State Trading Corporation (STC), which was given full authority to import adequate quantity of rubber to meet the deficit, had distributed only 36 per cent, that is 6,300 tonnes, in the last two months as against the 17,500 tonnes recommended for import and distribution by the Rubber Board. This recommendation, it may be noted, was endorsed at the meeting of the Rubber Board on March 8 where representatives of the rubber goods manufacturing industry as well as rubber plantation industry were present besides STC representatives.

According to Mr. M. K. Kapoor, President, All India Rubber Industries Association (AIRIA), though STC has in stock about 5900 tonnes recently it is likely to consider further release of rubber only after April 10.

This, according to him, has created the present critical situation for the rubber industry and this will also have cascading effect in the coming

Further, the buffer stock scheme which had worked so efficiently during the first year, has miserably failed to achieve the objectives in the last two years inspite of Rubber Board's timely recommendations for import of adequate quantity.

Due to STC's failure in containing the prices vis-a-vis the buffer stock scheme at Rs. 1700 a quintal, the industry suffered a loss of about Rs. 25 crores.

Fearing closure of many units in the prevailing circumstances, the industry has urged the Government to come to its rescue by eliminating the factors, including procedural delays and snags, responsible for the present situation.

TECHNOLOGY IMPORTS: DISCLOSURE FEE ALLOWED

The Union Government has allowed payment of 'disclosure fee' as an 'enabling facility', in foreign collaboration cases involving total technology payments exceeding Rs. 1 crore.

This facility, according to an official press note issued in New Delhi on March 25, is to be made available on priority to design engineering consultancy companies and public sector industries/other agencies in India rather than the technology source itself.

It was under the consideration of the Government that in all major cases of technology imports, where entrepreneurs have been issued letters of intent and where the need for foreign collaboration is clear, entrepreneurs may be allowed payment of a disclosure fee up to a ceiling of $ 40,000 automatically, and, in excess of that subject to Government approval.

The following criteria are to be adopted in allowing the disclosure fee.

Where the applicant holds a letter of intent for the project and the need for foreign collaboration is clear, the payment may be allowed more or less on an automatic basis. The exact amount within a ceiling of $ 40,000 may be decided on factors like size of the projects, criticality of the technology etc. and where the applicant does not hold a letter of intent, pre-feasibility report of the project from a competent consultancy organisation may form the basis for allowing it

R & D UNITS IN HIGH-TECH :

Foreign cos to be allowed entry

The Union Cabinet is believed to have decided to allow foreign companies to set up 100 per cent owned R and D units in the country. Modalities are being worked out to lay down guidelines for these units. The decision has been taken to encourage R and D in high-tech areas and also to check braindrain.

Experts point out that the large-scale industrial units have already been asked to create an R and D cell to develop further the existing know-how.

In fact several concessions have been extended to the industry to set up these cells. The department of science and technology and the Planning Commission have been of the view that it is essential for the indigenisation of imported technology to have a phased programme with a clause to the right over future developments of the imported technology. That is, the technology sellers would have to agree to part with the developments and upgradation of the technology that might take place in the company. In fact all the technology collaboration and import proposals are supposed to insert this clause in the agreement.

As a further step, the government now proposes to bring in foreign companies prepared to set up 100 per cent owned R and D units in this country. It is stated that in Europe the companies have billions of dollars worth of R and D plans but are finding skilled manpower very expensive. This is the main reason why the developed countries are keen to collaborate with the Indian companies.

It is not only the availability of cheap manpower but highly skilled personnel comparable with anywhere in the world. These sources point out that foreign companies are not averse to the idea of setting up R and D units in this country.

It is stated that these units would provide opportunities to get highly skilled manpower which looks westward for the lack of good opening in New Delhi besides creating R and D facilities in the country.

The modalities for the operation of the units are being worked out with suggestions coming from various quarters.

One such proposal states that the foreign company should be asked to employ atleast 95 per cent of personnel from within the country. A certain minimum wage should be fixed consistent with the qualifications, experience and calibre of the employee. The entire remuneration should be paid in India.

It is also suggested that the foreign owner of the R and D facility must bring in each year, on a non-repartriable basis, certain amount of foreign exchange in hard currency which must be spent in India.

All the capital goods, expendables and office equipment brought into India should not be rented out, sold or used for any other purpose other than R and D activity of the company. Such equipment should be allowed to be imported into the country at an import duty of 10 per cent. This should be brought on a repatriable basis so that the Government of India should not bear the burden in any way.

Authoritative sources point out that a decision on the modalities would be taken soon. However, the operations of the facilities would be on the lines of the 100 per cent export-oriented units. The department of science and technology is worried over the braindrain.

It has noted that over 70 per cent of the IIT graduates seek their fortunes abroad leaving the country with a serious problem of lack of talented, skilled manpower.

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PANEL REPORT ON NITROGENOUS FERTILISER PLANTS:

Indigenous units may be hit

The Varadarajan committee recommendations on new nitrogenous fertiliser plants, if implemented, may seriously impair the growth of fertiliser industry in the country, according to a report by Pradeep Puri in the **Economic Times**. Worse, industry circles feel, the recommendations are ill-conceived and are likely to prove harmful in the long run.

The report suggests a drastic change in approach to the fertiliser sector, particularly with regard to the role of imports versus indigenous production in meeting increasing consumption requirements.

While in respect of phosphatic fertilisers, complete dependence on imports is recommended, with regard to nitrogenous fertilisers, where the domestic resources are available in abundance, the so-called "make versus buy" option has been suggested with emphasis on the latter.

In fact, out of an estimated deficit of about 51 lakh tonnes by 1994-95, it has been suggested that about 35 lakh tonnes could be met through both imports of urea and DAP while for meeting the rest of the demand, necessary additions to indigenous capacity could be considered.

The case in favour of imports apparently involves two basic presumptions — easy availability of fertilisers from abroad and that imports are relatively cheaper than indigenous production.

The industry says that regarding assumed comfortable global supply situation, it is abundantly clear from the MMTC's paper given in the report that as per the FAO forecast, the deficit of nitrogen for the world as a whole is expected to increase to 1.13 million tonnes in 1989-90. Even the world Bank/FAO/Unido projections presented at a fertiliser working group meeting in mid-1987 project a deficit of 0.98 million tonnes of nitrogen in the world demand-supply balance by 1991.

Further, a tightening situation is anticipated in nitrogen for the next years as there is little ammonia capacity being built, particularly in view of the low realisation prices from the exports and the high capital cost of commissioning new projects, making further investment economically unviable. In view of this, the industry sources say, the assumption that urea imports to the tune of four million tonnes could be conveniently arranged and with some advance planning could even be increased to six million tonnes per annum is fallacious.

The assumption that the imports are likely to be cheaper than indigenous production is also misleading. In fact, it will be erroneous to look merely at the world market prices at any particular point of time and compare them with cost of indigenous production from new plants which is not quite comparable in view of the cascading effect of input prices which are substantially and unrealistically higher than that available to the fertiliser industry in the exporting countries.

In particular, the aspect of lower prices until 1986 which were at near dumping levels not covering even the cost of feedstock in the exporting countries needs to be kept in view. In fact, at these prices, the fertiliser industry the world over suffered heavy losses. The North American industry alone incurred a loss of $500 million during 1986.

During 1987, these prices firmed up by $30-32 per tonne in respect of urea and $70-80 per tonne for DAP — that too when India had stayed away from the international market in view of continuous glut on the domestic front. The trend may even get accentuated should India decide to give an advance indication of its intention to rely heavily on imports.

The apparent high cost of indigenous production and consequential subsidy burden should not be looked at in isolation, the sources say. An objective analysis of the factors leading to higher cost would clearly show that much of the worry expressed on this account is unjustified. The capital costs tend to be high partly on account of the impact of the general phenomenon of inflation and "even more importantly certain decisions which are taken on considerations other than that of cost minimisation aspect alone."



For instance, to promote balanced regional development, the national policy is to locate new industrial projects in backward areas and fertilisers is no exception. This has significant cost implication in terms of development of the necessary infrastructure. In the case of RCF, Thal for instance, the cost on account of railway siding alone was Rs. 30 crores. Then, there is additional burden on account of various levies such as customs and excise duty which inflate the project cost. In any case, practically all the parameters having a bearing on the project-cost, size, location, technology, choice of contractors — are all decided by the government and consequently beyond the control of the industry.

Likewise, the cost of various inputs including feedstock besides freight which constitute the bulk of the high cost indigenous fertiliser, are also within administrative price control. While the increases in such administered prices continue unabated, far from seeking a reduction, it would be illogical to use the consequential high cost of fertiliser production as an argument against development of indigenous industry and instead cheaper imports. Through realistic pricing for such inputs, it should always be possible to bring down the cost of fertiliser production to reasonable levels.

The sources say that it is important to note that while it is well within our control to keep a check on the cost of indigenous production through judicious management of various factors including input pricing, taxation, the interest rates, the cost of procuring fertilisers from abroad is something absolutely beyond our control. This aspect too has clearly weighed in favour of the policy towards increasing indigenisation of fertiliser availability and the same needs to be pursued with greater vigour in the most cost-effective manner, the industry sources say.

Regarding to recommendation that only large-size ammonia plants of 1350 tpd with matching urea capacity be considered, it is important to note that their commissioning not only involves higher capital cost, longer gestion period, higher foreign exchange outgo, but also less interest from prospective entrepreneurs, particularly in view of heavy resource implications.

In contrast, the middle-size ammonia plant of 400-600 tpd offers significant savings in all these respects. Even a 200 tpd ammonia plant with equivalent urea capacity entails lower quantum of foreign exchange outgo per tonne. The need for adoption of this route to additional capacity creation becomes all the more pressing at this juncture when the country is passing through a serious resources crisis and that the entrepreneurs find it extremely difficult to mobilise resources either by way of promoters' contribution or by tapping the capital market, they say.

YELAHANKA POWER UNIT BY NEXT YEAR-END

The power minister, Mr. J. H. Patel said in the legislative council that the Yelahanka power project in the joint sector will be commissioned before the end of next year.

Replying to Mr. K. N. Nage Gowda (Congress) during question hour, the minister said that already a French firm had been selected for procurement of the main equipment and orders for supplying the machinery will be placed shortly.

NHPC'S RS. 1000-CR TRANSMISSION SCHEME

The National Hydroelectric Power Corporation (NHPC) is taking up an ambitious programme for strengthening the transmission network in the northern region.

Estimated to cost Rs. 1,000 crores, more than 3,000 circuit km of 400-kv transmission line along with associated sub-stations are proposed to be erected in the next six to seven years.

The programme also includes erection of 500 circuit km of 800-kv transmission line for the first time in the country.

The transmission schemes proposed to be executed under the programme include the 400-kv Nathpa Jhakri transmission system, 400-kv Moga-Bhiwani transmission system, and 800-kv Manpur-Moga transmission system.

Power to be generated at the defferent hydro-electric projects proposed to be set up in Jammu and Kashmir and Himachal Pradesh will be distributed through the new transmission system to Punjab, Uttar Pradesh, Haryana, Delhi and Rajasthan.

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Fresh oil strike in cauvery basin

Oil and gas have been struck at Nannilam in the Cauvery inland basin — raising the economic prospects of this oil zone.

The well at Nannilam, drilled to a depth of 3,460 metres, has been put to further testing, following the flow of oil at the rate of 150 barrels per per day and gas at 2,933 cubic metres a day.

Located 12 km, west of Tiruvarur in the Thanjavur district of Tamil Nadu, the Nannilam site is the fourth reservoir to have yielded results in the Cauvery inland basin, according to a press release issued by the Oil and Natural Gas Commission in Madras on March 26. The other reservoirs are Narimanam, Kovilkalappal and Bhuvanagiri.

The other three reservoirs have already been put on the "early production system" without waiting for the full-fledged development of the infrastructural facilities. So far, nearly 1.41 lakh barrels of oil have been produced and supplied to the Madras Refineries from these three structures.

ONGC has also evolving a plan to supply 40,000 cubic metres of gas every day from the Kovilkalappal reservoir to the Tamil Nadu Electricity Board to run a 5-mw gas turbine.

So far, ONGC has cumulatively spent about Rs. 260 crores on the exploration and related activities in the Cauvery basin, while the spending on this basin in the remaining period of the Seventh Plan would be of the order of Rs. 200 crores, the press release added.

As for the Krishna-Godavari oil basin, the press release said ONGC is expected to establish a production potential of 0.25 million tonnes per annum at GS-16-2 prospect by the end of the year. The ONGC Chairman, Col. S. P. Wahi, recently reviewed the progress in that basin, the release added.

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GAS STRUCK WHILE DRILLING BOREWELL

Some workers, drilling a borewell near Baroda, appeared to have struck gas which began spewing out with great force this afternoon.

According to the Fire Brigade Chief Mr. Mahendra Desai, the gas, accompanied by water, began gushing out when the workers started using a compressor to send air down the well.

The presence of inflammable gas is confirmed by sensors and the fire brigade personnel assumed it to be natural gas.

The Oil and Natural Gas Commission in Baroda was informed of the incident and experts are expected to arrive soon to investigate the incident.

The borewell is being dug on behalf of the owners of a huge commercial complex, called 'Suraj Plaza' comprising two ten-storeyed buildings in the area.

Immediately after the gas started spewing out, offices in both the buildings were evacuated and the entire area was cordoned off by the police. The workers had dug up to a depth of about 170 feet when the gas began gushing out, according to Mr. Desai.

A UNI Correspondent, who visited the spot, saw that the water jet rose up to a height of nearly 120 feet with tremendous force.

The fire brigade personnel with several fire tenders are standing by to cope with any emergency situation.

M AND M ACQUIRES DRILLING RIG

Mahindra and Mahindra (M and M) has recently acquired an off-shore jack-up drilling rig at a cost of $ 10.75 million from the French company Forasol-Foramer.

The 'Lle D' Amsterdam' is currently stationed at Bombay high on contract to the Oil and Natural Gas Commission a press release issued by the company said.

SALEEMPUR AROMATICS COMPLEX:

Kribhco and Iffco major contenders

The two fertiliser giants in the cooperative sector—Iffco & Kribhco—have emerged as major contenders for the Rs. 1000 crores petrochemicals project at Saleempur in U.P., according to a report in "The Economic Times".

These two companies which have done exceptionally well in the field of fertilisers are trying to outdo each other in their endeavour to bag the Saleempur aromatics complex.

Faced with bleak prospects, the major fertiliser producers are keen on diversifying into other areas. It is only because of the depressing scenario on the fertiliser front that the NRI company incorporated by Mr. Swraj Paul has already backed out of its plan to set up a fertiliser project. Several other promoters are also dragging their feet.

It is well-known and has also been acknowledged by the minister of state for fertilisers, Mr. R. Prabhu that last year fertiliser companies had to make distress sales by offering huge discounts. This resulted in a loss of about Rs. 400 crores for these manufacturers.

Enquiries with knowledgeable circles indicate that apart from Iffco and Kribhco, various other companies have evinced keen interest in the Saleempur project.

The letter of intent for the Saleempur aromatics projects was originally issued to the Pradeshiya Industrial Corporation of U.P. (Picup) in early 1986. Picup was not able to undertake the project in time and the letter of intent lapsed in early 1987. Although Picup was keen to collaborate with Reliance Industries for setting up the complex, it was not able to take any decision. In any case, Reliance is likely to implement the Rs. 750 crores Gujarat gas cracker project and will not be able to take on another large project.

The government is keen to award the project to a company which has sufficient funds at its disposal. Serious thought is being given to assigning the Saleempur complex to either Iffco or Kribhco. Both have an excellent track record. Kribhco is perhaps one of the few companies in the world to have managed to have achieved nearly 100 per cent capacity utilisation at its Hazira plant in the first year of production.

In addition, both these companies will be generating sizeable amounts in internal resources in the current financial year. Iffco and Kribhco are expected to have available Rs. 350 crores each for investment in fresh projects.

The other companies which are being considered for award of this project are the Indian Petrochemicals Limited (IPCL) in the public sector and JK Synthetics in the private sector.

A final decision is expected to be taken after a thorough review at various levels of the government which will take over a month to be completed.

HALDIA PETROCHEM SEEKS EXTENSION OF FOREIGN TIE-UPS

The board of Haldia Petrochemicals Ltd., met recently to seek extension of the tenures of foreign collaboration agreements. The validity of the agreements expired because of the delay in the Central government's approval of the project.

Mr. Jyoti Basu, West Bengal chief minister, while talking to newsmen in Calcutta pointed out that the Prime Minister, prior to his departure for Sweden, had promised that the Centre's approval would be given within 10 days. "Many 10 days have passed since then but nothing has happened so far", he observed. The chief minister failed to understand the reasons for the delay in giving clearance, more so when the IDBI's technical committee had already accorded its approval.

Mr. Basu said he was also perturbed by rumours in Delhi. "Although I don't give much credence to rumours, what I've heard is disturbing", he said adding that there was a move to clear the proposal for a petrochemical complex in Gujarat which would render the Haldia project redundant.

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TRANSFER OF RESPONSIBILITY TO GAIL:

ONGC contests govt. move

A piquant situation has developed over the transfer of responsibility — of processing, transporting and marketing gas from the Oil and Natural Gas Commission (ONGC) to the Gas Authority of India Ltd. (Gail). ONGC has, in fact, punctured the hopes of Gail by contesting the government "order" to it to transfer its responsibility in these areas to Gail.

As per the letter issued to ONGC by the petroleum ministry towards the end of February, the commission was asked to shed its responsibility of processing, transporting and marketing by March 31, albeit in a phased manner. The ministry had asked ONGC to transfer to Gail projects in the Krishna-Godavari and Cauvery basins, Tripura western onshore region excluding the Hazira gas processing complex and the compressed natural gas (CNG) project.

ONGC feels that the government letter cannot to treated as a directive. In fact, it was a mere D.O. letter it says. In any case, it may be possible to effect a custody transfer for the free gas facilities in the Krishna-Godavari basin and Tripura. It will not, however, be possible to transfer the processing facilities in case of associated gas since facilities are the same for both oil and gas. This, ONGC contends cannot be done except at the cost of national interest.

In a letter to Mr. S. Varadan, who is holding additional charge of the petroleum ministry, Col. Salaya Pal Wahi, ONGC chief has said that in the Krishna-Godavari basin and Tripura, it will be possible for the commission to come to some understanding with Gail "so that right from the beginning the layout and design of facilities could be done in a manner which did not create problems."

Further, Col. Wahi has noted that the existing facilities in the western onshore region do not lend themselves for any such bifurcation. ONGC, of course, has no objections to Gail taking over the CNG project.

When Mr. Varadan was contacted by **The Economic Times** for his comments, he said, "we cannot comment on everything that appears in the press." Other senior officials in the petroleum ministry either preferred to keep quiet or were conveniently not available.

In the case of Krishna-Godavari and Tripura gas basins, ONGC maintains that the transfer cannot be effected by the end of this month, as desired by the petroleum ministry. According to it, this process is time-consuming. Likewise, the commission has contested the attempt to fix the price of gas after the transfer. It feels that the price of gas has to be determined first.

Perhaps the most interesting argument of ONGC is that the government order is not something that can be implemented straightaway. According to information here, the commission feels that such transfers have to be approved by Parliament. Moreover, even the two boards of directors, of Gail and ONGC have not yet approved the transfer.

Sources in Gail, on their part, feel let down. Repeated queries only elicit the point that the recent government move is a follow up of the cabinet decision. According to the sources, the decision to give these responsibilities to Gail was taken by the cabinet in early 1984. The current government order of late Februrry, therefore, is binding on both ONGC and Gail. Gail is therefore, merely waiting for the government to act now.

SSIs NERVOUS OVER WITHDRAWAL OF MODVAT

Fear and tension have gripped small scale industrialists as the day for the withdrawal of Modvat benefits to small units draws near.

The "Draconian" notification no. 190/87 takes effect on March 31 and till day no alternative scheme has been announced in spite of the government's assurance to either rescind the notification or work out an alternative scheme, according to the president of the Federation of Associations of Small Industries of India (FASII), Mr. P. B. Duggal.

It may be recalled that finance minister N. D. Tiwari had advised revenue officials to find out a via media by which the notification could be rescinded and at the same time the government's revenue interest could be safeguarded at a meeting with FASSI, AIMO and NAYE representatives on October 21st last.

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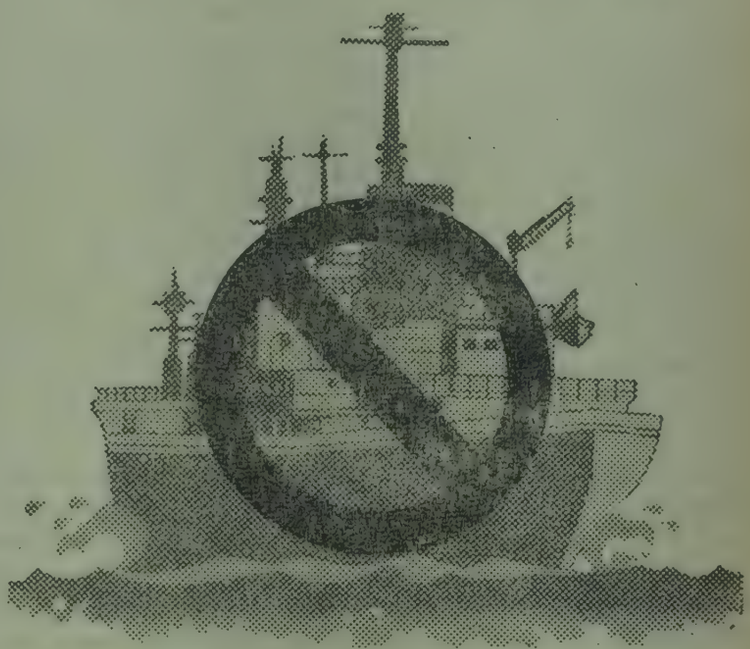
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KAMA sore at lack of sops to small units

The Union Finance Minister, Mr. N. D. Tiwari, has given a very favourable package to the agriculture sector and has announced a number of other concessions for the weaker sections in the Union Budget 1988.

But the small-scale industries seem to have been neglected. This sector contributes Rs. 61,100 crores by way of production and Rs. 2,785 crores by way of exports at 1985-86 level. In March 1986, when Modvat was first introduced, three major concessions were given to SSI. In the span of just two years, all these concessions are being withdrawn, says a Kalyan Ambarnath Manufacturers' Association (KAMA) press release.

Under Rule 57B of the Modvat scheme provision has been made for allowing credit of duty which may be in excess of the duty actually paid on the inputs made by SSI. Under para 5 of notification No. 175/86 dated March 1, 1986, provision has been made for allowing credit of duty in respect of goods which are subject to concessional rate of duty and used as inputs under Modvat at the rate that would be leviable but for exemption available under the said notification.

In simple language, on most of the items the SSI paid duty at five per cent but their customers were allowed to take 15 per cent credit under the Modvat. This provision indeed made purchases from SSI very attractive to any other customer operating under Modvat. For this provision alone more and more small units opted for payment of duty rather than seeking exemption.

Excise authorities also admit that due to this provision more transactions came on record and the documentation culture developed. The loss of excise duty has been more than made up by more collection of income-tax, sales tax and octroi. Yet suddenly, the powers in Delhi realised that they are losing Rs. 100 crore due to this provision.

However, it was forgotten that the concessions are meant for the support to a sector which deserves encouragement. All that talk of the role of the small sector in the national economy, its contribution in generating employment and better utilisation of local resources was brushed on one side. Notification No. 190/87 was issued in August 1987, marking the end of this provision.

After a strong representation from most lobbies of SSI, the date of implementation of this notification has been postponed till March 31, 1988. Expectations were high that either a new package for SSI will be announced in the Budget or at least this black notification (No. 190/87) will be rescinded. But nothing has occurred. When the Government can give a concession of Rs. 249.26 crores to just three man-made fibre and yarn manufacturers, can it not sacrifice Rs. 100 crores for 15-lakh small-scale units asks KAMA.

The second provision was to permit the benefit of exemption or concessional rate of duty under Notification No. 175-86 of March 1, 1986 to goods manufactured and cleared by a SSI, even if it bears the brand or trade name belonging to a unit which is not otherwise eligible for the SSI concessions.

The logic behind this provision was the inherent weakness of the SSI, lack of marketing expertise and resources constraint for an all-India based distribution network. The arrangement worked well.

But there are always some big houses which exploits the loopholes in the law. A few instances came to the knowledge of the Government. Instead of punishing the offenders, the axe fell on the small units. Notification Nos. 223/87, 224/87 and 225-87 of September 22, 1987 were issued withdrawing the above-referred concessions from October 1, 1987.

The matter was represented to the government by SSI. The assurance was given that the relief package will be announced in the Budget proposals. But nothing materialised.

The third important concession to SSI under notification No. 175/86 was exemption up to 15 lakhs for one heading and up to 30 lakhs for more than one heading in the payment of excise duty.

If the SSI opts for Modvat, thereafter or from the beginning itself, it will be required to pay duty which is 10 percentage points lower than the normal rate of duty, up to Rs. 75 lakhs clearance. In simple words, the products of SSI will be 10 per cent cheaper.

In this year exemptions have been announced on a few products and duty has been lowered to five per cent only for some other products. Exemption of five per cent duty brings a large scale unit and a small scale unit at par adds the release.

100 P.C. EOUs: 25 P.C. OUTPUT SALE NORMS NOTIFIED

Close on the heels of the decision to grant cash compensatory support (CCS) to 100 per cent export-oriented industries and those located in export processing zones, the government today notified the guidelines for the sale of 25 per cent of their production in the domestic tariff area (DTA) subject to certain conditions.

According to an official release, this "facility will not apply to certain sensitive items like jewellery, diamonds, precious and semi-precious stones, motor cars, recorded video and audio cassettes and silver bullion."

This sale scheme will be applicable in two slabs. The sale up to 25 per cent of the production will be permitted in respect of items where the indigenous content is the total cost of material inputs required for manufacture, is above 30 per cent.

In the case of items of manufacture in which the indigenous content is less than 30 per cent, sale will be permitted only up to 15 per cent of the ex-factory value of the production of the unit.

The 100 per cent export-oriented units will have to apply to the export commissioner in the commerce ministry to avail of this facility. In the case of units located in export processing zones, the applications will have to be submitted to the concerned development commissioner.

The facility will be available from April 1, 1988, and sales will be permitted based on production and export performance during the current financial year (1987-88) also.

New speciality chemicals plant at Bangalore

Mr. Lawrence M. Urquhart, Group Managing Director, Burmah Oil plc, inaugurated, a speciality chemicals plant at Hosakote, Bangalore, on March 26. Indtech is a subsidy company of Indrol Lubricants and Specialities Ltd., formed in the joint sector with Karnataka State Industrial Investment & Development Corporation Ltd., to manufacture telephone cable compounds, pharmaceutical jellies and industrial waxes, in technical collaboration with Dussek Campbell Ltd., U.K.

The Karnataka State Industrial Investment & Development Corporation having set up a plant to make jelly filled cables in Mysore, were looking out for indigenous suppliers of cable jellies. This gave Indrol an excellent opportunity for diversification into an allied area. In this, Indrol were fortunate that Dussek Campbell, a unit of Burmah Speciality Chemicals Ltd., were already manufacturing and supplying cable filling compounds worldover.

A high quality jelly plays a major role in producing cable to meet the exacting specifications of Indian P&T.

Cable jellies are sophisticated formulations based on both natural and synthetic oils, polymers and waxes which are further fortified with additives to retard degradation during storage, cable manufacturing operations and throughout the long service life of the cable.

Most of the jellies in use until recently were imported in order to meet the exacting requirements. With the Hosakote plant going on stream, it will be Indtech's endeavour to make high quality products available indigenously for Indian cable makers, saving the country much needed foreign exchange.

About half-a-dozen jelly filled cable manufacturers have already started producing cables and between themselves are in a position to manufacture enough length of cables of 10 to 200 pair sizes. The different types of jellies that are being used at present vary from mineral oil-wax based polyisobutylene based and synthetic jellies. The total demand as of now is estimated to be around 3000 metric tonnes. Four to five units would be starting production during 1988 thereby raising the demand by another 1000-1200 MT.

When all the units go on full stream it is anticipated that the total demand of jellies would be in the region of 6000 MT, say in the year 1990. With indigenous capacities built to cater to this demand fully, it is expected that the imports of jelly would come down substantially.

Indtech with a licensed capacity of 5000 MT, is therefore, well poised to establish itself with the Indian telephone cable industry. With a full fledged R&D set up at Dussek Campbell and commitment to keep pace with latest developments in the world, Indtech would bring to the Indian cable industry, all the necessary modernisations to suit changing trends. An example of this latest technology would be the development and supply of jellies for Fibre Optics to Hindustan Cables at Hyderabad for their Fibre Optic cable plant.

Since Dussek Campbell are also leading wax blenders for different industries world over, it was decided to undertake to manufacture, side-by-side, pharmaceutical jellies and industrial waxes at Hosakote. The plant has licenced capacities to produce 1500 MT of pharma-jellies and 200 MT of industrial waxes per year. Industrial waxes are blends of different mineral and synthetic waxes and polymers for industries like Investment Casting, Rubber Burmah group can give Indral.

The age old process of investment casting is being revived to manufacture intricate and precision castings for aerospace, defence, leisure, medical and automotive industries. Indtech will be manufacturing a range of wax compounds to meet this specialised application.

Industrial waxes are used for diverse applications — packaging, laminating, hot-melt coatings, rubber protection, etc., and it will be in these areas that Indtech will be offering specialised products to meet the industry's specific requirements. Petroleum jellies used for pharmaceuticals is yet another area where they will offer grades to substitute imports and meet the stringent requirements of the industry.

During his visit, Mr. Urquhart will also have discussions with the Indrol management on their future plans for diversification and identify what assis- Tyres, Packaging, Printing, etc.

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Energy planning for 15 years suggested

The horizon for energy planning should extend to 15-20 years instead of five years in view of the long gestation time required for completion of projects and the large capital investments involved. According to the mid-term appraisal of the Seventh Plan in the energy sector, "this is all the more necessary in order to match the reserves of primary energy sources, their exploration and exploitation".

It is further noted that for the north-east which is rich in hydrocarbons, coal and hydel resources, it is necessary to draw up an integrated energy plan. Meanwhile, the Planning Commission has initiated exercises for a detailed perspective plan in the energy sector including the use of mathematical modelling to determine the long-run marginal costs and the most optimal fuel mix at minimal domestic resources costs for the nation as a whole. The Eighth Plan and the subsequent plans are expected to be better fitted into this total perspective.

Regarding planning for rural energy, the mid-term appraisal of the Seventh Plan is that it is necessary to have decentralised area planning "because of wide variations in regard to accessibility to energy sources, income levels and food and social habits. An optimal mix of forms of energy to meet the area demands has to be planned in detail."

The appraisal notes the development programmes are broadly on target. However, the areas which need greater attention in the coming years include: new starts in power and coal to maintain the tempo of growth in the Eighth Plan; improvements in the efficiency of utilisation of energy and its conservation; optimal utilisation of gas, accelerated build-up of hydrocarbon reserves and indigenous production; sustainable methods for meeting rural energy needs with the major objective of reducing fuelwood consumption, rationalisation of energy prices to cover costs including costs of subsidies, facilitate free exchange of surplus power within a region and to encourage inter-fuel substitution wherever it is in the interests of the national economy, and prepare detailed long-range plans for the energy sector as a whole.

Referring to the overall trends, the mid-term appraisal notes that in the first two years of the Seventh Plan, primary energy consumption grew at an average rate of 6.4 per cent against 7.9 per cent projection while the growth rate in GDP was 4.4 per cent. The energy elasticity co-efficient is thus 1:45. The share of oil in primary energy consumption has remained steady at around 31 per cent.

The Indian economy, it is noted, continues to be energy intensive. The growth in consumption of high-speed diesel in 1986-87 was 7.3 per cent. The consumption of furnace oil, however, has been brought down. Oil production was more or less according to target and the refineries throughput was marginally higher. Coal production may be lower than targetted but may not prove a constraint because of the stocks, import of coking coal for steel making, lower hot metal production and the steady improvement in railway movement.

About generation, it is explained that the total requirement for electricity generation in the terminal year of the plan was projected at 295 billion kwh of which 280 billion kwh was to be generated in the utilities. The revised estimate of demand is now placed at 278 billion kwh of gross generation.

Thermal generation, though steadily improving, is as yet below the norms adopted for the Seventh Plan while hydel has fallen short because of the drought.

Consequently, the anticipated generation in the terminal year may be around 252 billion kwh by the utilities and 21 billion kwh by the captive power plants. With the addition of about two billion kwh from the Chukha project, the total availability is likely to be 275 billion kwh, leaving a small deficit of three billion kwh (1.1 per cent), in energy requirement at the all India level. This gap is likely to be reduced further as the large captive power units in steel, fertilisers and aluminium (1600 mw) will start contributing higher energy output by the terminal year of the plan. The deficits in some regions and states may, however, be higher than the all India figure.

Capacity addition in the plan was targeted at 22,245 mw with 150-on-going projects. The actual achievement in the first two years has been 6848 mw. As capacity addition of 4486 mw is anticipated for 1987-88. Accordingly, in the first three years, achievement is estimated around 51 per cent of the target against 36 per cent in the corresponding period of the Sixth Plan.

The Seventh Plan is, however, likely to end with an addition of 22,402 mw — an achievement of 100.7 per cent (against 72 per cent in the 6th plan). Even though there have been slippages in some projects, the inclusion of the gas based projects in the plan has added about 1926 mw of power in the total anticipated generation.

Projects totalling 23,400 mw have already been sanctioned for this period (as on March 31, 1987). Following budgetary constraints, resources for these have to come from market borrowings, supplemented by external assistance.

A.P. MITRA

Dr. A. P. Mitra, Director-General of Council of Scientific and Industrial Research (CSIR), has been elected Fellow of Royalty Society of Britain in recognition of his contributions in the area of radio science, particularly ionospheric physics.

There are only a few scientists from India, including Prof. M. G. K. Menon and Dr. M. S. Swaminathan, who have had the distinction of being honoured by the Royal Society with its prestigious fellowship.

Dr. Mitra, 61, was educated at Calcutta, Sydney (Australia) and Pennsylvania (United States).

He is the originator of the now widely used cosmic radio noise technique for exploring ionosphere, one of the world pioneers in atmospheric chemistry and also a father figure in the development of ionosphere physics in India.

Dr. Mitra has many scientific awards to his credit and is member of many scientific bodies at international and national levels. Dr. Mitra, before being appointed Director of CSIR, was Director of National Physical Laboratory, Delhi.

IMPORT-BASED PROJECTS:

Falling re., high duties cast a damper

The steady depreciation of the rupee and increase in customs duty on project imports over the last five years has had a dampening effect on Indian projects based on imported plants and machinery, an Associated Chamber of Commerce and Industry of India (ASSOCHAM) study says.

According to the study, Indian projects with an import content of 80 per cent rose by 203 per cent in costs, over the period December 1983 to February 1988, when the imports were made from Japan.

Over the same period, the escalation for imports from West Germany, France and the US was 147.9 per cent, 125.2 per cent and 91.9 per cent respectively.

The study suggests that entrepreneurs have been particularly badly hit as customs duty on capital goods is by and large levied on an ad-valorem basis. This mean that an increase in the value of imported plant and machinery due to appreciation of foreign currencies (and depreciation of the rupee) automatically leads to an increase in total import duties payable.

On top of this, import duties on project imports have over the last five years been increased by the Government. At 90 per cent now, project import duty is up from 40 per cent in 1983-84.

The study says that a necessary fallout of this escalating project cost is a fall in the rate of return on the project. As the project cost has gone up mainly due to the depreciating exchange rate of the rupee, the enhanced cost cannot be passed on the consumers and have to be absorbed by the producers themselves.

The study says that due to fluctuations in rates of exchange, there may be some gains to the Government in the form of customs duty collections on account of the ad-valorem duty, in the short run. And the Government, faced with a resource crunch, may feel that a hidden devaluation of the Indian rupee has come as a boon.

It, however, warns that in the long run the country has to pay a heavy price as it is likely to retard the process of industrialisation.

Hence, the ASSOCHAM study says, the Government should, while computing customs duty on an ad valorem basis, allow a weighted margin to the extent of fluctuations in rates of exchange.

NEW OIL REFINERY TO BE SET UP IN ASSAM

A high power committee has been constituted by the Government to go into the modalities for setting up another oil refinery in Assam.

This information was given by the Minister of State for Petroleum and Natural Gas, Mr. Brahm Dutt, to a delegation of All Assam Students' Union which met him in New Delhi.

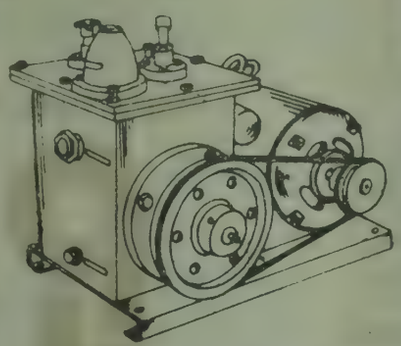
AASU President, Mr. Keshab Mahanta, said that the proposed fourth refinery was to be set up under the Assam accord. The delegation told the Minister that the proposed refinery, which was initially to have two million tonnes capacity of crude annually and later be increased to three million tonnes, must have equal participation by the State Government

IRON, STEEL IMPORT NORMS SIMPLIFICATION

Simplification of procedure for import of iron and steel will form part of the forthcoming import-export policy for 1988-91 to be announced on March 30.

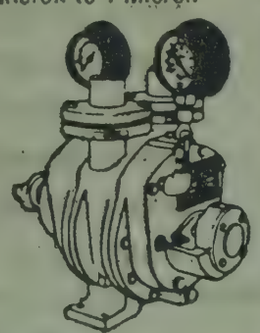
Imports consist mainly of flat products such as hot rolled and cold rolled sheets, tin mill black plates and some long products such as bars and rods structurals. The value of imports would be about Rs. 1,000 crores in the current year.

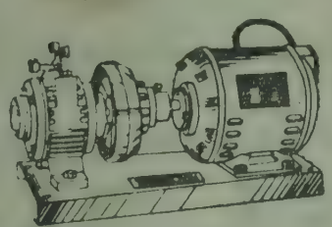
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CERAMIC FIBRE UNITS:

No response to duty relief plea

Persistent appeals made by two ceramic fibre manufacturers to the Government to grant excise duty relief for the products treating them as energy saving items and also ban their imports have cut no ice.

Both Murugappa Morganite Ceramic Fibres Ltd. (MCMF) and another company in Gujarat are claimed to have made several representations to DGTD and the Industries Ministry to disallow the import of fibres under OGL in view of the sufficient capacity already built up.

Similarly, they have sought duty exemption on the ground that the quality of the products matched international standards and they ensured a fuel saving of 30 to 40 per cent (Rs. 4-crore saving annually) compared to conventional refractories.

However, without going into the merits of the case, the Government argues that the "time is not ripe" both for removing the item from OGL and extending the duty exemption, regret senior executives of MCMF.

Talking to newsmen in Madras recently on the occasion of launching a new product of MCMF, "Indwool Zirconia fibre" Mr. M. V. Murugappan, Chairman, Mr. A. R. Lakshman, Director, and other officials of the company said the MCMF pioneered the manufacture of the products by promoting a unit at Ranipet in 1984 with an annual capacity of 500 tonnes.

It is a joint venture of Corborandum Universal Ltd. and Morganite Ceramic Fibres, UK, which has operations in several countries. MCMF now produces a wide range of fibres for using them as insulation materials in industrial heat handling applications.

The demand for the products is also catching up. Major consumers of MCMF include, SAIL, TISCO, FACT, MFL, SPIC. More recently, it has executed a prestigious order for IPCL by supplying 120 tonnes for its Maharashtra Gas Cracker complex.

The company also made a debut in the export market through its supply of about 85 tonnes to Europe and Middle East with the help of its UK partner. It is striving hard to secure more orders.

Following MCMF, a second plant with a capacity of 1000 tonnes has come up in Gujarat. Another one is in the offing at Indore with a similar plant size. The capacity utilisation of MCMF which averaged 45 to 50 per cent in the past is likely to be 70 to 75 per cent thanks to IPCL order.

While the domestic demand now ranges from 400 to 450 tonnes a year, imports come to 100 tonnes. Although the landed cost of the material is high (because of the duty structure) still the flow continues as the industries are forced to import the fibres as part of "project package" from the suppliers.

Strangely, the spokesmen said some of the domestic companies also favour imported fibres overlooking the huge capacity available. Even the IPCL order could have slipped, but for the hefty duty hike in project imports (from 55 to 85 per cent) imposed in the last Budget which prompted the company to place orders with MCMF.

Responding to a query, Mr. Murugappan said the company could not bank much on the export markets as they are highly competitive with abundant capacity. Moreover, the freight rates from India are very high which made the products dearer. MCMF has no buy back arrangement with the UK company.

Mr. Lakshman said the under utilisation of capacity is also reflected in the overall cost. He said the Government should have at least extended CCS for the products as they are already exported.

Mr. Murugappan feels the 'lobby is not strong' enough to impress upon the Government. However, he hoped to get a positive response. Ironically, he noted, rock wool, a low temperature product which is also in fibre form, enjoyed total duty exemption.

Dr. B. K. S. Jones, a Director in MCMF and Chairman, Thermal Ceramics Division of Morgan Crucible Zirconia fibre, was impressed by the quality of Indian company's management and its products. He said MCMF can count on the full backing from his company and will be accessible to all applications in the UK.

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Plea for 15% CCS on plastic woven sacks bags

Union Commerce Minister has decided to grant cash compensatory support (CCS) of five per cent of the f.o.b. value on exports of plastic woven sacks bags, fabrics and other madeup articles, including tarpaulins whether laminated/coated or not with or without liner and also to linoleum floor coverings.

The Ministry order will become effective on orders received on or after March 1, 1988 and would be valid till March 31, 1989. Welcoming the measure as a beginning in right direction, Mr. Ramesh Jain, President of the All India Tape Manufacturers Association (AIFTMA) pointed out that the CCS offered was too meagre to help export of woven sacks.

Stating that the Plastics and Linolcum Export Promotion Council, after assessing the data from the woven sacks industry has recommended a minimum CCS of 15 per cent, Mr. Jain stated that at the moment no new export orders were being taken up by the industry now as the raw material price of HDPE had shot up to more than $ 1400 per tonne.

Apart from severe competition from China, Korea and Taiwan, the international price for end product has shot up by $ 100 and the CCS at 5 per cent would not cover the export losses at this price.

If only the Government would hike the CCS to 15 per cent, the industry would export 50,000 tonnes per annum that would fetch Rs. 145 crores of foreign exchange. Since the industry was able to utilise only 25 per cent of its installed capacity of 1.6 lakh tonnes, an export effort of this order would help stabilise the industry. Mr. Jain fervently hoped that the Government would appreciate the efforts made by the industry in entering international market and grant the minimum CCS to stabilise the industry.

Mr. Jain stated that the Union Government on its part, should reciprocate by ensuring that at least 70,000 mt of woven sacks were absorbed by the cement and fertiliser industry in the country. This would help make the exports really competitive.

Mr. Jain drew the attention to the applicability of CCS order only from this month onwards whereas considerable export, in anticipation of CCS has been made since September last year. This should therefore be amended accordingly, he added.

Explaining further the effort being put in by the Association, Mr. Jain stated that a seminar on export prospects of HDPE woven sacks is being organised on April 9 at Bangalore. Experts from the Plastics and Linoleum Exports Promotion Council and Polyolefins India Limited (PIL) would be participating at the seminar in the presence of Mr. H. K. Khan, secretary, Petro Chemicals, Mr. Jain stated.

PLASTICS : CALL TO DIVERSIFY ACTIVITY

Mr. P. S. Pandian, Director of Industries and Commerce called on the Coimbatore industrialists to diversify into new lines of plastics taking advantage of sophisticated technology as there is scope for plastic-oriented industries in this area.

He was presiding over a seminar on "latest developments in plastic industry", conducted by the Coimbatore, Periyar, Nilgiris districts Plastic Manufacturers' Association.

Mr. Pandian also suggested that tool and die-making manufacturing could also be started.

Mr. H. C. Shah, Chief Manager, Polymers, Indian Petro Chemicals Ltd., Vadodara pointed out that there is acute shortage of raw materials. Also the tight position in the international market and spiralling prices have rendered the plastic industry uneconomical, he added.

PANEL TO INVESTIGATE FIRE AT PLANT

The department of Atomic Energy, (DAE), has constituted a six-member committee headed by Mr. V. Charan, executive director of the Gujarat State Fertiliser Corporation, to investigate into the incident of fire at the Baroda heavy water plant recently.

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COMPANY NOTES

Diamines & Chemicals

Diamines and Chemicals Ltd. (DACL), after meeting all stringent specifications of the foreign buyers, have been successful in procuring export orders for their ethyleneamines particularly diethylenetriamine (DETA). Consequent upon this, DACL's first consignment of 19 MT of DETA has already left the Indian port on 19th February 1988 for The Netherlands and another consignment of 40 M.T. of DETA is being shipped to Barcelona, Spain and soon thereafter, further consignment of 40 M.T. will be shipped to Belgium. Thus DACL have already made breakthrough in European market by exporting substantial quantity of DETA for the first time from India after meeting all the indigenous requirements.

It is heartening to note at this juncture that indigenous technology developed by DACL themselves by putting-up initially a small Pilot Plant has stood very well in comparison to the foreign standards. This naturally gives international recognition and credit to the technology developed indigenously at DACL's plant and at the same time will earn valuable foreign exchange for the country.

KRIBHCO

Krishak Bharati Co-operative Limited (Kribhco) has declared a maiden dividend of Rs. 13.84 crores for the co-operative year 1986-87 — the first full year of commercial operations thereby creating a record.

The managing director of Kribhco, Dr. K. K. S. Chauhan, presented a cheque for Rs. 10.32 crores to the Union minister of state for fertilisers, Mr. R. Prabhu.

The amount represents the dividend on the share capital contributed by the Central government to Kribhco.

Other recipients of dividend from Kribhco include Iffco and other member co-operative societies who had contributed share capital to Kribhco.

Kribhco has made a profit of Rs. 45.06 crores during the first full year of its commercial production on March 1, 1986, achieved a production of 14.15 lakhs tonnes of urea and 8.32 lakh tonnes of ammonia reflecting a capacity utilisation of 97.5 per cent and 93.4 per cent respectively — a world record for the fertiliser industry.

HIND HEAVY CHEMICALS ON VERGE OF CLOSURE

Hindustan Heavy Chemicals Ltd., one of the oldest chemical units making caustic soda lye in West Bengal, is on the verge of closure owing to recurring losses for the last four years and continuing escalation in production costs.

The company has incurred a total loss of Rs. 1.92 crores during the last four years from 1984, according to a company press release. The company employs 400 people in its factory.

The recent hike in the power tariff to Rs. 1.24 per unit effective from January 1, 1988 in W. Bengal has given a further blow to the company as power is the major raw material for manufacture of caustic soda. The monthly consumption of power by the unit is 33,64,000 units.

The company points out that it cannot compete with the other manufacturers of caustic soda lye including Durgapur Chemicals Ltd. as they are enjoying on an average 25 per cent lower power rate.

PFIZER

Pfizer Ltd. has maintained the dividend at 10 per cent for the year ended November, 1987. The sales have recorded a growth of 6.6 per cent at Rs. 73.4 crores against Rs. 68.8 crores in 1986. The profit before interest expense, depreciation and taxation amounted to Rs. 3.72 crores against Rs. 3.27 crores.

After interest (Rs. 81 lakhs against Rs. 91 lakhs) depreciation (Rs. 157 lakhs against Rs. 154 lakhs) and taxation (Rs. 102 lakhs against Rs. 48 lakhs), the net profit is marginally lower at Rs. 32 lakhs against Rs. 34 lakhs.

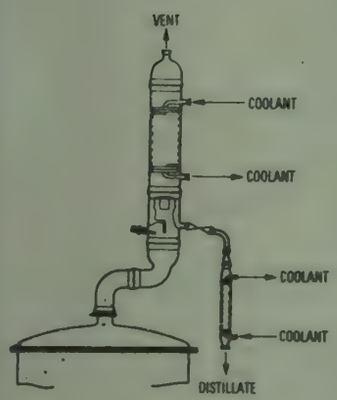
The company's profit margins have continued to be under pressure mainly because of increases in the costs of various inputs with practically no increases in the selling prices of the products.

HOECHST INDIA

Hoechst India has halved the dividend to 10 per cent for 1987 from 2[illegible] per cent paid in the previous year. Despite an increase in net sales to Rs. 158.81 crores from Rs. 143.64 crores. The gross profit has dropped to Rs. 4.05 crores from Rs. 4.60 crores.

After depreciation (Rs. 229 lakhs against Rs. 180 lakhs) and taxation (Rs. 45 lakhs against Rs. 80 lakhs) the net profit has slumped to Rs. 131 lakhs from Rs. 260 lakhs. The proposed dividend will absorb Rs. 96 lakhs against Rs. 191 lakhs in 1986.

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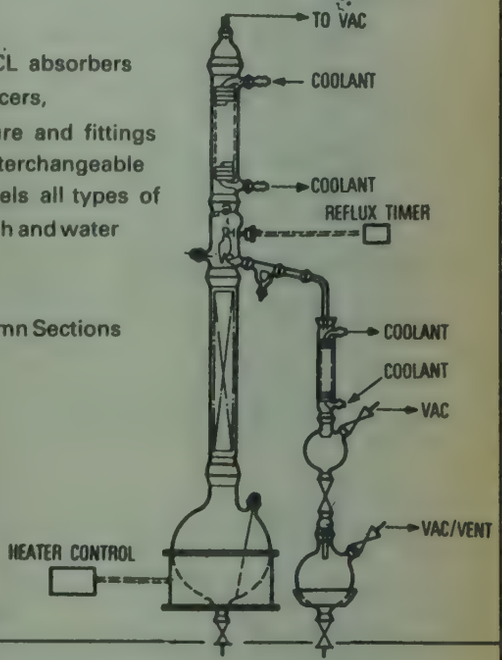
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SPOTLIGHT ON

Biotechnology & Life Sciences (Part 1)

SQUIBB (U.S.A.) PLANS JOINT VENTURES WITH CETUS FOR BIOTECH DRUGS

The U.S. drug manufacturer E.R. Squibb and the biotech concern Cetus have finalized a joint venture for the development and marketing of biotechnology produced pharmaceuticals.

The venture is expected to move into the development of new drugs in the anti-inflammatory, anti-infective and cardio-vascular fields. The first product to be taken up will be a monoclonal antibody developed by Cetus for septic shock.

The deal will see Squibb supply Cetus with some $75 million over 5 years for R & D funding. In addition, Squibb will purchase 5% of Cetus Stock for $40 million. This is the most significant alliance in the biotech field. Squibb had sales of $1.5 billion in 1986, and Cetus is the U.S.A.'s second largest biotech concern with a turnover of $50 million. Cetus will also give Squibb the right to market Cetus anti-cancer drugs in Japan and other nonU.S./European areas. (*Mfg. Chemist*, 7/1987, p. 15)

SUNGENE TECHNOLOGIES GRANTED PATENT ON DEVELOPING IMPROVED LINES OF CORN FROM TISSUE CULTURE

Sungene Technologies (U.S.A.) has been granted a patent covering its process to develop agronomically improved lines of corn from tissue culture. U.S. Pat 648,389 is the first of its type issued to a biotech company for regeneration of corn from tissue. Sungene's degeneration process is widely applicable to commercial parent lines used to produce hybrid corn for the $1.5 billion hybrid seed corn market. (*JAOCS*, July, 1987, p. 930)

TWO NEW THERMOSTABLE ENZYMES PRODUCING CYCLODEXTRINS ISOLATED

Canadian scientists at a small Canadian biotech firm Allelix (founded only in 1983 by the Canadian Development Corporation) have isolated two new enzymes that exhibit high thermostability and high productivity of cyclodextrins (CDs) from starch. This is a new landmark in cyclodextrin synthesis. The Canadian researcher at Allelix (Mississanga, Ontario) have recovered from soil bacteria two cyclodextrin glycosyl-transferases (CG Tases) —one yielding mostly L-CD and other mainly B-CD.

Cyclodextrin are cyclic oligosaccharides, composed of six (L), seven (B), or eight glucose residues bound through an L-1,4 linkage. B-CDs cost about 10-times as much, and r-CDs, 100-times as much. CDs are currently prepared by action of bacterial CGTases on gelatinized starch.

The torus configuration of CDs provides a hydrophobic cavity, enabling CDs to form inclusion compounds with a wide variety of materials. Commercial interest is growing in using CDs for separations and extractions, drug-delivery, stabilizing agents and other encapsulation applications in the food, pharmaceutical and agrochemical industries.

Allelix projects $50 million annual CD sales in U.S.A. alone within a couple of years, with at least twice that if food uses are approved by the FDA in U.S.A. Japan and several European countries already permit use in food.

One of the two CGTases produces primarily L-CD from starch, with high efficiency and with high thermostability without adding calcium ions. The company has neither disclosed much details on their isolation process, nor applied for the patent. However, the Company has recently filed for patent protection in U.S.A. on the other new CGTase.

This enzyme produces mainly B-CD from potato for corn starch, with a beta to alpha ratio of as much as 5:1, depending on conditions. Total yield of CDs from 15% potato starch is 50% more than for the CGTase now used commercially from Bacillus macerans. Moreover, unlike other CGTases, the new enzyme does not require prehydrolysis of starch by acid or amylase enzyme. Indeed, it performs better without prehydrolysis.

The new CGTase is secreted extracellularly by a bacterium belonging to a strain of B. licheniformis, but the Allelix researchers leave open the possibility it is a new species. This CGTase shows activity over a wide range of pH with an optimum at 5.5. Optimum temperature for activity is 65 to 75 degree C. This temperature range is ideal for rapid industrial scale production of CD. CGTase from B. macerans is inactivated at 55 degree C or higher.

The Company is now scaling up to pilot plant production (using a 400-L fermentor). The Company is planning to seek joint ventures to produce CDs, rather than make CDs itself. (*C & EN.*, 5/18/87, pp. 24-26).

NEW GENE LINK FOR MANIC-DEPRESSIVE ILLNESS IDENTIFIED

A chromosome segment whose inheritance predisposes an individual to develop manic-depressive illness has been located on the human x-chromosome by a team of researchers from Columbia and Yale Universities and !srael's Jerusalem Mental Health Centre. The finding follows by less than a month announcement of a different study showing that inheritance of a genetic defect on chromosome 11 also can lead to the disorder.

The new study examines the connection, or linkage, of inheritance of each of two genes known to be located on the x-chromosome with development of Manic-depressive illness in several large families of European and Asian Jews. In these particular families, the predisposition is clearly inherited together with the other two x-chromosome genes. The study confirms the genetic basis of the disorder as well as its association with several distinct genetic defects, any one of which could lead to development of the illness. The x-linked gene may account for one-third of all cases of the disorder, the researchers report. (*Nature,* 326, 289, (1987)) (*C & EN.*, 3/2/87, p. 6).

THE U.S. BIOTECH INDUSTRY FEARS COMPETITION FROM JAPAN

The burgeoning U.S. biotech industry fears that Japan may steal a lead in biotechnology in the coming years. The recent report 'Biotech-86 at the Crossroad' published by Arthur Young International expresses this fear succinctly.

Japanese companies are seen to have three distinct advantages; cheap capital, a less stringent regulatory environment and more government, academic and industry cooperation. Without more support from the American public this could lead to faster growth for Japanese companies and perhaps their European counterparts. (*Chem. & Ind.*, 6/1/87, p. 373).

THE ENZYME LIPASE POISED FOR GROWTH IN INDUSTRY

A recent Report from Chem Systems Inc. (Tarrytown, N.Y.) on 'Lipases — Production & Use' foresees a good future for lipases in several industrial fields. The Report analyzes the technology and economics of lipase production and use in chemical industry, including speciality, commodity and fine chemicals markets that are affected by lipase catalyzed processing; cocoa butter, fatty acids and 1-menthol. The Report covers the intensive research and development efforts that are underway for a variety of applications for speciality chemicals production via lipases. These include the hydrolysis of oils and fats for better colour, and odour in the production of soaps; partial hydrolysis and/or esterification to produce speciality monoglycerides and inter-esterification of fats and oils to produce novel triglyceride mixtures. The Report emphasizes that the future potential for lipases goes beyond their production and sale to the development of novel process applications and potentially unique new products.

For existing products, opportunities are said to include production cost saving through novel processing, higher production efficiencies or alternate feedstocks. (The Report is available by subscription from Dr. R.L. Medrick, Project Manage, Process Evaluation Research Planning Programme, Chem. Systems Inc, 30 South Broadway, Tarrytown, N.Y. 1059).

WEIZMANN INSTITUTE (ISRAEL) ATTEMPTS TOWARDS WORLD'S FIRST DICTIONARY OF GENETIC CODES

A unique handbook compiled at the Weizmann Institute (Israel), brings together relevant definitions of about 800 genetic sequences. In all 275 pages are alphabetically arranged, complete with indices and 400 useful references.

This compilation should assist genetic engineers in optimizing yields of commercial proteins, cancer experts to identify easily mutable sites in genes at which malignant transformations are suspected to originate and molecular biologists to know the meaning of the new genes and genetic fragments they have isolated. (*Science* Today, 8/1987, p. 25).

GENE BANKS & WORLD'S FOOD

A new publication 'Gene Banks & The World's Food' by D.L. Plucknett, N. JH. Smith, J.T. Williams and NM Anishetty (Published by Princeton University Press, pp., 247, $35) is a timely publication. The authors are experienced scientists and have assembled a wide range of useful information and data covering all aspects of germplasm collection, characterization, conservation and use. They rightly stress that the availability of genetic variability by itself is no insurance against genetic vulnerability to pest and diseases, unless trained plant breeders use that variability effectively. Gene banks are of little value unless we know what genes they contain.

The authors also refer to the new opportunities opened up by tissue culture and molecular biology for ex-situ conservation, particularly of clonally propagated material. Genetic engineering techniques have

enhanced the value of wild species and primitive cultivars, and DNA-transfer techniques are being rapidly refined.

This treatise will serve as an excellent source of information, particularly about the work being done by the International Agricultural Research Centres. The authors concentrate largely on the scientific aspects of conservation and make only passing references to matters relating to ownership, unrestricted access and the long-terms implicationof plant patent rights in a two-page section titled 'Seeds of Discord'.

The subject of genetic resources is no longer the exclusive concern of scientists, as it was in 1932 when Nikolar Ivanovish Vavilov first advocated plant-collecting expeditions. The UN's FAO has recently formulated several legal options for IARCs to ensure that the genetic collections in different parts of the world remain a common heritage of mankind.

Many countries have also subscribed to an International Undertaking on Plant Genetic Resources, formulated by FAO in 1983 to promote the free-sharing of plant genetic resources. In this context, the treatise 'Gene Banks & the World's Food' is a thoughtful and timely publication. (*Nature,* 11/26/87, pp. 321-22)

A NEW RAPID & CONVENIENT ENZYME TEST FOR DETECTING NARCOTICS IN THE URINE OF DRUG TAKERS

Customs official and police in 1988 will have a new tool at hand in their fight against drug abusers. The tool is a portable kit that detects almost instantly any traces of narcotics in the urine of suspected drug-takers. It is a simple test for drugs of abuse, including heroin, LSD, Cannabis, cocaine, amphetamines and barbiturates.

The test kit was developed jointly by scientists at Sunderland Polytechnic and a private company Cambridge Life Sciences.The Company will manufacture and market the test kit in 1988.

The test is a so called ELISHA (enzyme linked immuno-sorbent assay). The kit contains different reagents to test for different narcotics. The presence or absence of a drug is indicated by colour changes that occur when users mix the reagents with the samples.

Speedy results are only one advantage. The existing tests for narcotics in urine hold up investigation. Officials have to send samples away to laboratories which may take up to two days or more to return results. At present traces of narcotics in urine are detected with a sophisticated method of analysis using gas chromatography. This method is cumbersome and analysts need hundreds of millilitres of sample to obtain accurate results. In contrast the new ELISHA test is faster, convenient and reliable. (*New Sc.,* 12/3/87, p. 37)

LEADING BRITISH GENETICIST PROF. E.A. BEVAN VISIT CENTRE FOR ADVANCED STUDY IN BOTANY (CALCUTTA) FOR COLLABORATION RESEARCH

Prof. E.A. Bevan, Head of the School of Biological, Queen Mary College (QMC), London was currently in India since December 1987 for a period of 2 months. He was visiting professor at the Centre for Advanced Study in Botany at the University of Calcutta, under the auspices of the British Council Division, British High Commission.

The main purpose of his visit was to contribute to collaborative research which continues between QMC and Calcutta University on chromosome structure and behaviour of yeast and spirogyra.

The objective of the collaboration is to elucidate chromosome structures and behaviour in (a) the commercially important yeast species and (b) Spirogyra and other related algae which are increasingly being used in biomass experiments as energy products.

The need for information on the chromosome behaviour and structure of yeast is exemplified by its increasing importance in genetic engineering as a host organism to express transferred eukaryotic genes. Spirogyra poses a fundamental problem in that it is highly radio resistant. The laboratory results which are being transferred to experimental plantation are of developmental importance to India's agriculture. (*British Inf. Service,* B. 470, (24/12/87))

LACTATING ANIMALS FOR BIOTECH DRUGS

Genetic engineers in the U.S.A. have created mutant mice that secret a valuable human drug in the female's milk. The scientists report their technique, the first ever to turn, lactation into biotech drug manufacture, could make goats, cows or any lactating mammals into protein factories in future.

Integrated Genetics, a biotechnology company in Framingham, Mass, U.S.A. and the National Institute of Health last October unveiled 'transgenic' mice that harbour a human gene for expressing a protein, tissue plasminogen activator (TPA). The protein can dissolve blood clots in humans. Until now, companies have been vying for the new TPA market by creating the drug in vats of gen-

etically altered microorganisms. Alan Smith, a British molecular biologist who now directs research at Integrated Genetics, reported recently that transgenic animals can outproduce bacteria or yeasts in bioreactors by 10 to 100 times.

The scientists located and cloned the gene for producing TPA. They then fused it with a region of the genome that switches genes on and microinjected this 'construct' into a fertilized mouse egg at the single-cell stage. The adult mouse and offspring through five generations, integrated the gene and secreted TPA. (*New Sc.*, 10/29/87, p. 26)

PLANT GENETIC ENGINEERING GETS A NEW TOOL

Plant molecular biologists have been using sections from the DNA of a specific bacterium Agrobacterium tumefaciens as a tool for inserting foreign genes into plant DNA. Now scientists at Bio-Technica International, Cambridge, Mass, have shown that bacterial genes can be moved into plants by another way. The mechanism that bacteria use to exchange genes among themselves (a process called plasmid conjugation) can be mobilized to transfer genes from bacteria to plants.

This research therefore, not only provides another tool for genetic engineers, but raises the possibility that bacteria may have influenced the evolution of plants by naturally inserting genes. (*Nature*, 328, 172, (1987)).

NEW APPLICATION OF MICROBIOLOGY IN CHEMICAL PROCESSING

Hewin International Inc. announced the publication of a comprehensive study entitled "New Applications of Microbilogy in Chemical Processing".

The chemical processing industries are being revolutionised by current developments in industrial microbiology, which will have far reaching effects into future global markets. By the turn of the century around US $65 billion worth of new products and processes will be realised through advances made in biocatalysis, genetic and protein engineering, imported reactor and system design, and other innovations brought about by the modern biotechnological era. Energy, food, chemicals, pharmaceuticals, agriculture, metal recovery and pollution control will all be influenced by these new applications over the next decade and beyond.

The report details the technical advances and commercial prospects for a whole range of biotechnological industries and products including single cell protein, commodity and fine chemicals (including pharmaceuticals), the prevention of biodeterioration, metal accumulation, oil recovery, waste treatment and pollution control and fermented foods and beverages.

The report of over 500 pages, illustrated and supported by more than 100 exhibits including tables, figures and graphical presentations, completed during the first quarter of 1988 can be obtained for a subscription price of US $ 3,500.00.

For further details, contact Dr. H. Willinger, Director, Hevin International Inc., Van Leyenberghlaan, 157/159, P.O. Box 7813, 1008 AA, Amsterdam, The Netherlands.

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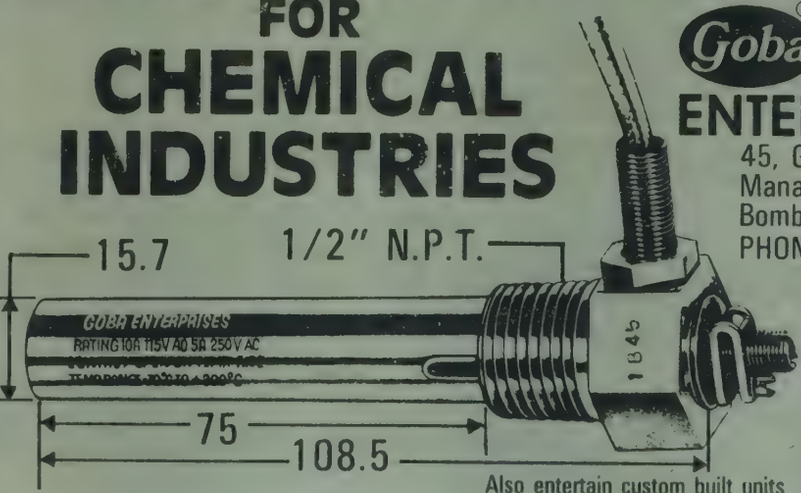
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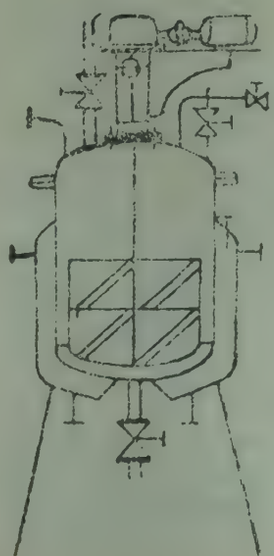
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THICKNESS MEASURING BREAKTHROUGH

Elcometer Instruments of Manchester, Northwest England, has introduced two new thickness measurement instruments which are smaller, lighter and more powerful than the company's Elcometer 256, which was the first portable coating thickness instrument to offer memory, statistics and print-out. Now, the Elcometer 300 range includes instruments capable of measuring on ferrous or non-ferrous (conductive) substrates, or both, and is available in three versions: Basic, Stats and Stats/printer.

The new Elcometer 300 Basic model — the 300B — is very simple to operate and is claimed to be highly suitable for users requiring accurate, easily identifiable measurements. This pocket-sized instrument is compact with only five control touch pads.

The 300S Stats and the 300SP Stats/printer versions take the fullest advantage of microprocessor control capability. A much wider range of operations is easily accommodated through the dedicated display and a functional keyboard design. Features common to both versions are selectable statistics, large memory capacity, batch analysis, high/low limit warnings, data downloading and new calibration.

Elcometer says that unreliable calibration is one of the major problems in coating-thickness measurement that can lead to inaccurate readings and difficulty in measurement. It can even prevent measurements being obtained. Three new calibration methods available on the model 300 provide reliable calibration, saving the operator considerable time and effort:

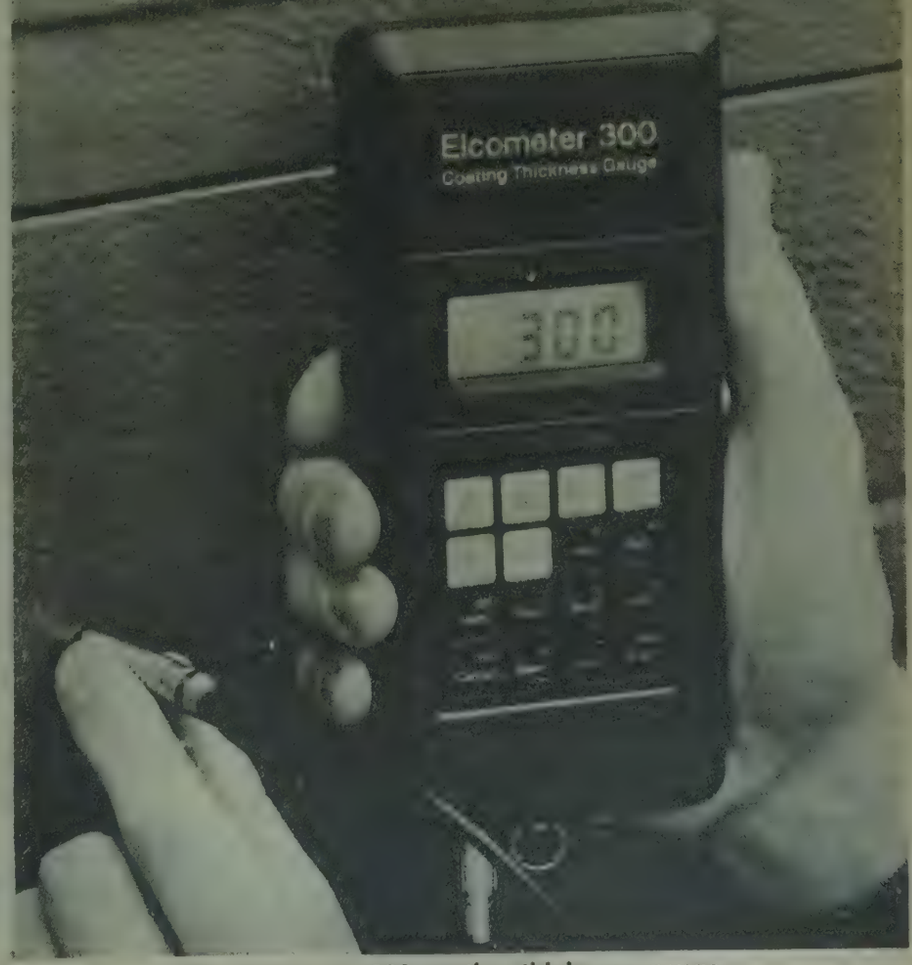
* **Calibration memory by batch.** Different calibration values can be stored in the batch memories. Once set up, the Stats model can measure thickness on products with different calibrations — due to curvature, shape, roughness or steel characteristics — simply by entering the appropriate batch.

* **Calibration through coating.** A facility appropriate for maintenance painting/checking.

* **Single point calibration.** It eliminates the use of calibration foils for many applications.

Elcometer refers to the 300SP as the "thinking" coating thickness monitor. The Stats/printer model offers print-out capability — clear, hard-copy proof of readings taken with statistical analysis and histogram. Bulk data can also be retained in the memory for later downloading to a data collection device or computer. This enables the user to produce reports based on data over a long period of time.

A software package, Datastat, is available to enable this to be done. The A4 print-out shows a clear list



The Elcometer 300 coating thickness gauge

of all readings, all cancelled readings, a full statistical summary and a histogram. The histogram gives a visual interpretation of the spread of results illustrating two-peak, or asymmetric, distributions which would not be apparent from statistical analysis alone. The printout can be conveniently filed for a permanent record.

The Elcometer 300 uses one 9 V dry or rechargeable battery. When the rechargeable version is ordered, it is provided with both a battery and an external recharger.

The second instrument to be introduced is the Model 202 Ultrasonic Materials Thickness Testing instrument. This supersedes the Model 200 and offers improved capability when measuring the thickness of steel. The ability to measure on steels where the surface is pitted or coated is improved, thus enhancing performance in the field of maintenance painting where corrosion damage has occurred.

For further details contact Elcometer Instruments Limited, Edge Lane, Droylsden, Manchester, United Kingdom, M35 6BU.

FLEXIBLE MANUFACTURING YIELDS IMPROVED QUALITY VALVES

British valve manufacturer Hattersley Newman Hender (HNH) has undertaken a major redevelopment at its works in Ormskirk, northwest England, which will result in increased production with improved quality and an ability to respond very quickly to market requirements. It is believed to be the most sophisticated operation of its kind in the world.

HNH was previously the first company to be awarded the Kitemark licence by the British Standards Institute for a complete range of general purpose iron and copper alloy gate, check and globe valves.

The company can now produce 2600 components a week from its new flexible manufacturing system (FMS). Two major developments are responsible for this capability; the FMS centre, and the introduction of the Replicast foundry operation.

Replicast produces components with a greater degree of dimensional accuracy than is possible through conventional greensand casting methods, and is also faster.

It involves the use of expanded polystyrene forms, resulting in a product that is both free from sand inclusions and of consistent quality, needing only light shot blasting and little or no fettling.

The pound 5.5 million FMS centre, designed by Vickers subsidiary



View of FMS showing AVG carrying valves passing FM100 machining centre

Kearney Trecker Marwin, has five computer-controlled FM100 machining centres, two special outfacing machines and eight automatically guided vehicles (AGVs) which are used to move components around the system.

Over 2500 component variations can be manufactured on the FMS system while the eight AGVs are used to move the components and fixtures around. After machining, parts are taken to the automatic wash plant and on to the assembly area where the computer controls the selection of trim and other features, depending on the specification of the valves being produced. An AGV then collects the components and delivers them to the automated storage facility. To cater for the wide variety of components there is also a store for fixtures and one for fittings, serviced by automatic stacker cranes.

For further details contact: Hattersley Newman Hender Limited, Burscough Road, Ormskirk, Lancashire, United Kingdom, L39 2XG.



Example of tubing and packaging as supplied by Lancashire fittings, showing the pipe fittings and but-weld joining system

STAINLESS STEEL TUBING FOR CARRYING HIGH PURITY GASES

Lancashire Fittings is supplying a pound 250,000 order for stainless steel tubing and fittings to CERN (the European Laboratory for Particle Physics) for its large electron-positron storage ring (LEP). The LEP particle accelerator is to occupy a tunnel 27 km in circumference cut into solid rock near Geneva, on the French-Swiss border. The tunnel is 3.8m in diameter with larger sections at intervals which house magnets and water-cooled vacuum chambers in which experiments will be carried out.

The order is for the stainless steel tube gas distribution system. This will be fed with a wide variety of high purity gases and this purity must be maintained throughout the system. The order covers 55,500 m of 304L 18/8 stainless steel tube in a range of sizes from 10 mm to 101.6 mm outside diameter, all with a passivated surface finish. Wall thicknesses are to non-standard dimensions; 2 mm for the largest tubes and 1 mm for special fitting designed to be joined by orbital butt welding.

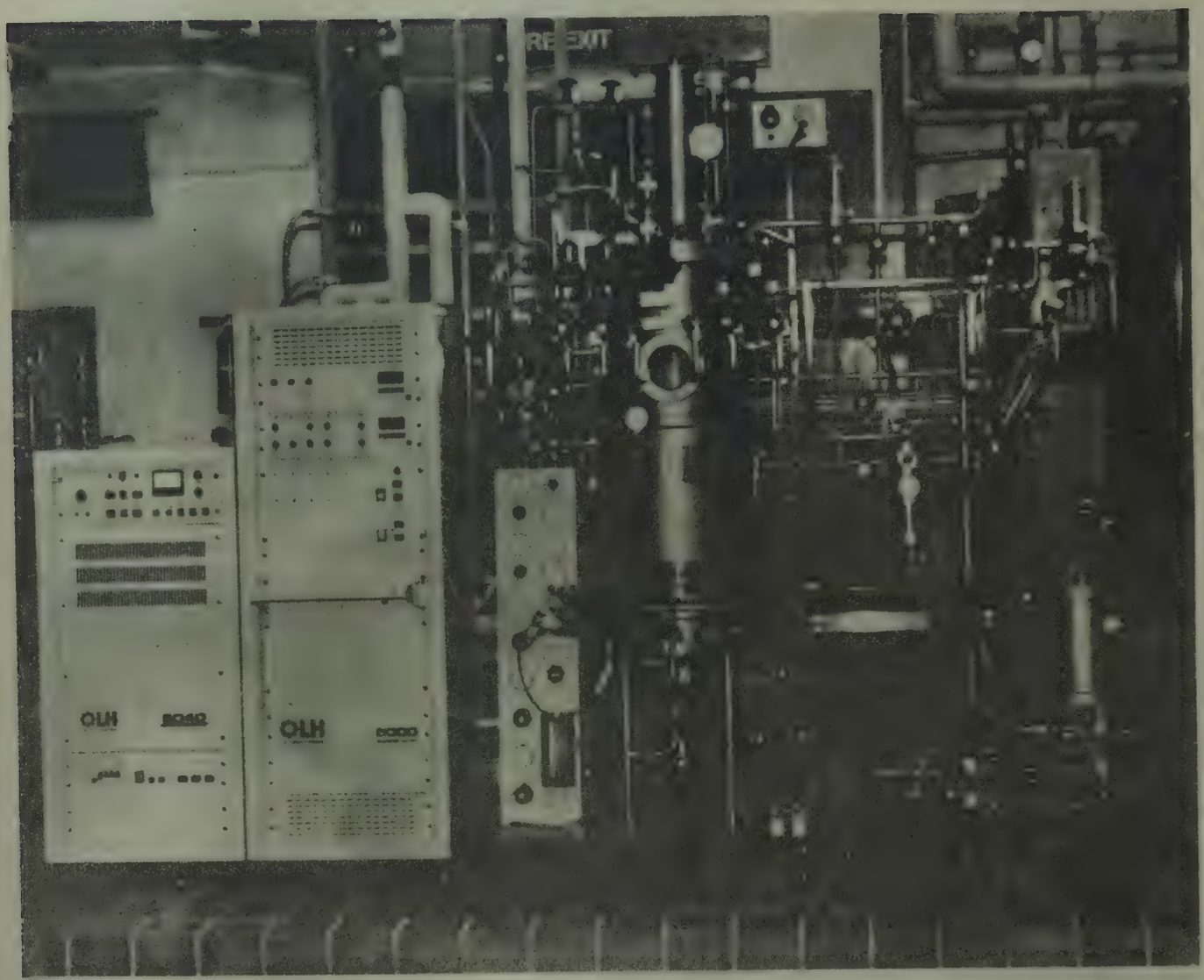
A new passivation plant installed at Lancashire Fittings' works handles the tube in 6 m lengths. It consists of a series of tanks in which the tube bores are treated and supercleaned. By treatment in a series of chemical baths a perfect transparent protective film of chromium oxide is formed and the metal is then in a passive state with maximum resistance to corrosion. Finally, the tube is despatched in packaging closely specified, with protection by aluminium foil and polyethylene film.

Passivated tube is also in demand for other high technology fields such as laboratory equipment, biotechnology and silicon chip production.

For further details contact: Lancashire Fittings Limited, County Works, Claro Road, Harrogate, North Yorkshire, United Kingdom, HG1 4AF.

MODULAR PILOT PLANT SCALE FERMENTERS

Designed for vessels of total volume from 150 to 750 litres, the new 5100 and 5110 series modular pilot plants from LH Fermentation Limited of Slough, West of London, are engineered and finished to the highest standards. They are tested



An LH Fermentation 5100 150 litre pilot plant installed at the London Centre for Biotechnology

to pass the British Standard for pressure vessels, BS 5500 Category 31985, before despatch to the customer. Developed for batch, fed-batch and continuous culture of bacterial, plant or animal cells, the 5100 and 5110 series fermenters can be applied to a wide range of different biprocesses.

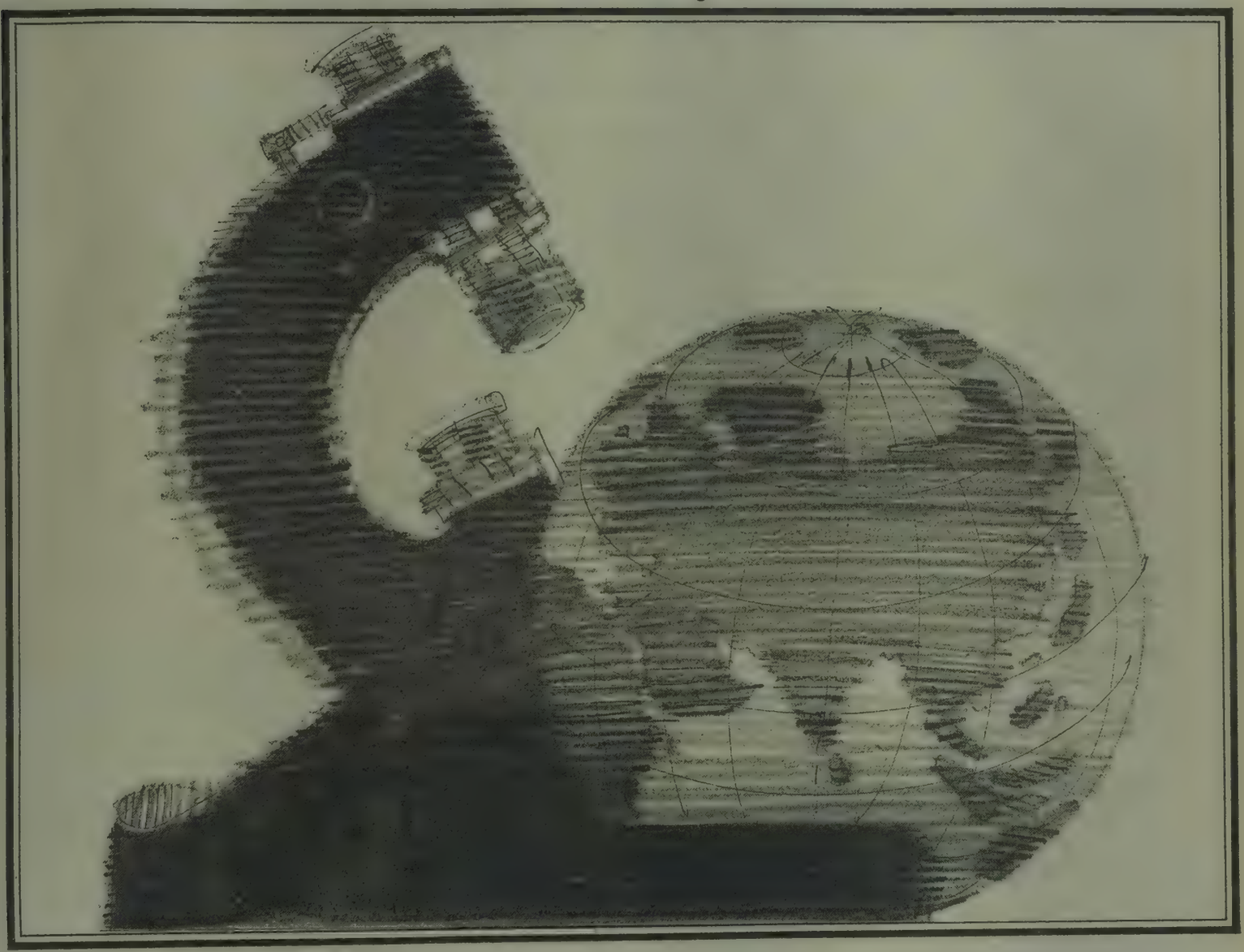
Both the 5100 series (150 or 225 litre capacity vessels) and 5110 series (500 or 750 litre capacity vessels) are skid-mounted and can be shipped intact so that only final connections to services are required on site. Three addition vessels of 5/10 litre or 10/20 litre capacities are provided for the 5100 and 5110 series pilot plants respectively, and each system can be custom-built to user's specific requirements.

All systems can be operated either manually or under fully automatic control via their comprehensive instrumentation and service console. To allow extensive and flexible automatic control of the whole process, up to 48 actuated valves can be accomodated by the standard service module.

Every precaution has been taken in the design of these pilot plants to minimise vibration and therefore the possibility of premature structural failure, and to allow for convenient and effective sterilisation. Particular attention has also been paid to such safety aspects as the positioning of valves and hot pipes with respect to operator access, and to handrails. (8D288/DG).

For further details contact: LH Fermentation Limited, Bells Hill, Stoke Poges, Slough, United Kingdom, SL2 4EG.

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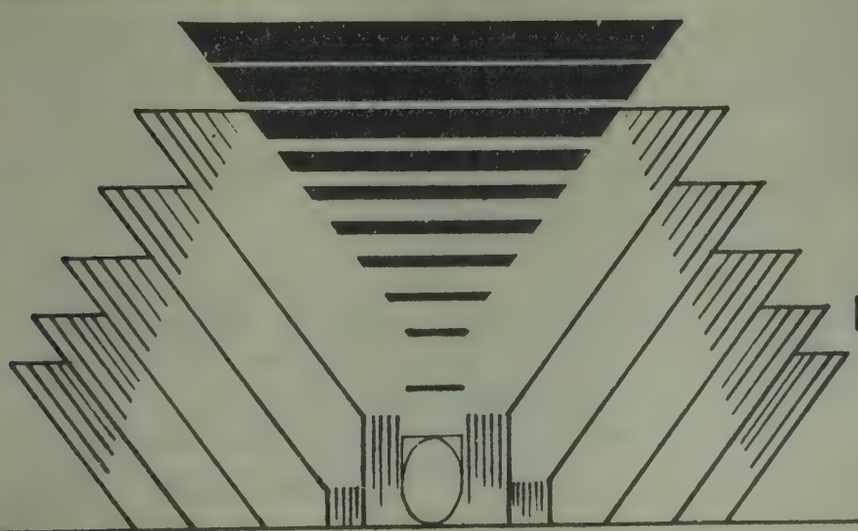
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Chemical News From Abroad

KEMIRA PLANS MAJOR TiO_2 EXPANSION IN THE U.S.

Finland's Kemira is to spend $70m on a major expansion of titanium dioxide capacity in Savannah, Georgia in the U.S. The investment will boost capacity from the current 100,000 ton/year to 145,000 ton/-year by early 1990.

The firm has also given a boost to its U.K. paints business with two recent acquisitions.

Kemira operates production units for TiO_2 in Savannah based on both sulphate and chloride technology, roughly on a 50-50 basis. The expansion consists of a major debottlenecking programme in the chloride plant.

Titanium dioxide pigments have been in short supply and additional capacity will be needed to meet the growing demand, the Finnish company says. The additional production is destined mainly for the U.S. market, which continues to be a net importer of TiO_2, mostly from Europe.

The company's European production base is in Pori, Finland, where it has a capacity of 80,000 ton/year, based on the sulphate route. Around Fmk90m ($22m) is being set aside to control effluent from the plant. Providing the necessary waste water permits are obtained, debottlenecking work will boost capacity at the plant to 84,000 ton/year.

Kari Auto, director of the TiO_2 division declined to comment on Kemira's European expansion plans. He put the company's current global TiO_2 turnover at Fmk1.4bn. The Pori plant uses ilmenite raw material, imported from undisclosed sources, while the U.S. facilities, originally based on the Kerr McGee technology, process slag and natural rutile sand.

Separately, Kemira has boosted its presence in the U.K. decorative paints market with the purchase of two companies — Valspar Paints Limited and Alexander, Fergusson & Co. — with total turnover of around Fmk 120m.

The move, which follows only a couple of months after Williams Holdings' purchase of Hoechst's decorative paints business, takes Kemira into third place after ICI and Williams, with around 18% of the U.K. market. Kemira's U.K. subsidiary Macpherson Plc has a 10% share, while Valspar's share is put at 8%. The deal does not include Valspar's plant or personnel.

Kemira says the move is "in line with its strategy to strengthen and purchase market shares in selecrive point market areas". Macpherson is currently investing some Fmk 120m in its facilities over the next two years.

U.K. FIRM SELLS COATINGS OUTFIT

Courtaulds subsidiary, Fothergill & Harvey is selling its metal surface coatings unit, Fothergill Engineered Surfaces Limited. According to Fothergill & Harvey, the unit is a "significant contributor to the group" but does not fit in with long-term core objectives.

Fothergill Engineered Surfaces has turnover of around pound 5m — margins have varied between 10-20% — and the firm has 170 employees.

Its main operations involve the manufacture of metal surface coatings and treatments for a number of industries including oil, food and chemical processing.

A spokesman for County NatWest Limited, the bank advising Fothergill on the sale, said there had been many enquiries from potential purchasers including niche coatings manufacturers and chemical multinationals.

Fothergill & Harvey's main business is advanced materials and electrical insulating materials. It was acquired by Courtaulds in February 1987.

SANOFI BUYS CANADIAN SEED FIRM

Sanofi plans to reinforce its position in the seeds sector with the acquisition of a leading Canadian firm, Kingroup.

Based in Chatham, Ontario, the company ranks top in the Canadian soya market with a 20% share and claims second place with 9% of the maize market. In recent years the Canadian firm has diversified into rape seed. Kingroup's turnover is in the region of Can $35m ($27m).

The company has a marketing outlet in the U.S. and a subsidiary in Chile which is mainly research-based. It also has a 20% stake in France Canada Semences.

Sanofi's seeds interests are held through its subsidiary Rustica Semences in France and the U.S. firm Dahlgren. This latest acquisition will boost its research efforts centred at its Labege facility near Toulouse.

Sanofi has boosted its perfumes interests with the acquisition of two Italian firms, Florbath Profumi di Parma and Fendi Profumi. The

companies are linked to Italian couturiers Fendi and Krizia. Consolidated turnover reached over FF100m ($17.8m) at Fendi in 1987 while Krizia reported sales of FF235m, including $8m on the U.S. market.

SHARE PRICES PLUNGE AT ITALIAN FIRMS

Share prices in Montedison and Ferruzzi group companies plunged last week after Raul Gardini, head of the Italian agri-industrial conglomerate, announced restructuring plans.

In the first week of February, trading on the Milan bourse was suspended in shares of Montedison, Iniziativa Meta, Silos and Ferruzzi Agricola. It resumed the following day only to see further falls.

Ferruzzi itself was lambasted for not issuing sufficient information about its proposal which involves the transfer of Meta (Montedison's financial services unit) to Ferruzzi through a share deal which investors claimed favoured the Ferruzzi family. It had been thought the transfer of Meta was more likely to involve a straight cash transaction.

The unpopularity of Gardini's reorganization plan is thought to have taken the Ferruzzi boss by surprise and it is possible that he may be forced to consider a rethink. Gardini may be prepared to raise cash by reducing his stake in Montedison from 70 to 51%, still leaving Ferruzzi with control of the Italian chemicals giant.

If Gardini does reconsider the reorganization, the long-rumoured sell off of some of Montedison's assets are likely to be put on ice until an alternative plan is devised. An industry source discounts the divestment of the company's drugs business Erbamont and says that Gardini regards this asset as a core business to be retained.

EEC TO APPROVE PVC JOINT VENTURE

The European commission is proposing to authorize LVM, the joint venture company set up by DSM of the Netherlands and the Belgian chemicals firm EMC in 1969 to enable cooperation in VCM and PVC.

LVM's nameplate capacity in VCM is around 450,000 ton/year and current output is estimated to be approaching 500,000 ton. In PVC, debottlenecking work at the end of last year boosted suspension grade PVC capacity from 340,000 ton to 390,000 ton/year.

ENICHEM FIBRE DEAL

Italian chemicals and fibres firm Enichem is expanding its operations in the microfibres sector through the acquisition of a 49% stake in Lorica SpA. It plans to raise its stake to 50% to form a joint venture with Fineur, the other shareholder.

The deal involves the construction of a new L10bn ($8m) unit near a site owned by Alcantara, a joint venture between Enichem Fibre and Japan's Toray for the production of microfibres for synthetic leather.

FRENCH CHEMICALS SECTOR SEES FORTUNES RISE

In 1987, the French chemicals industry saw sales rise 2% on the previous year to around FF287bn ($51bn). Output grew 3%, double the expected rate. This compares with provisional figures of 2% in West Germany, 6% in the U.K., 5% in the U.S. and 1% in Belgium. GNP growth in France was 2% in 1987 against an European average of 3.5%.

A look at various sectors of the French chemical industry reveals contrasting growth. Fertilizers fell back 2.5% while petrochemicals and plastics were ahead 5%. Perfumes and cosmetics rose 4.6% while pharmaceuticals grew by a relatively modest 2%.

Domestic demand for chemicals rose 4% in 1987. Imports were up 7% against just 3.5% for exports. In value terms, exports moved ahead by 4.4% compared with 1986 to FF114.6bn. Imports, at around Ff93.3bn, were up by FF1bn on the previous year. Exports to the U.S. were hit but there was a positive trade balance with Europe.

Trade with the Far East was still in France's favour, although marginally down on the previous year at FF1.4bn, while the balance with Eastern Europe was up from FF1.8bn to FF1.9bn. The positive balance of trade with developing countries slipped back from FF7.7bn to FF6.5bn.

Jean-Claude Achille, president of France's chemical industry trade group Union des industries chemique, noted that the industry "has managed to maintain its position" and described it as a "bastion of resistance" in the erosion of France's industrial trade balance.

While the chemical industry work force has stabilized in many countries, numbers in France continue to decline with the fall in 1987 hovering around 1.5%. The trend is expected to continue and more restructuring is needed, Achille said.

Last year the French chemical industry invested around FF14.3bn in plant and equipment, over FF15bn in research and around FF1.3bn in training. These figures account for 11% of the industry's turnover and

30% of its added value. In 1986 and 1987, overseas acquisitions rose to some FF18bn, mainly in the U.S. and Germany.

Despite strong growth in the chemical industry's output since 1970 (up 95%) UIC says investment in new capacity is now back to its 1970-72 level heralding the end of heavy base chemical investments as fine chemicals/pharmaceuticals take over. Between 1980-1985, volume growth has been 38% for fine chemicals and specialities and just 2% for commodity chemicals. At the same time, the industry has undergone major rationalization and productivity efforts both in plant and workforce terms.

The prospects for France's chemical industry in 1988 will be affected by the monetary crisis and its possible aftermath, says UIC. Lower demand and growth could lead to falling production in a number of sectors while exports to certain areas will remain difficult because of the low dollar. Achille says this may mean France will see a growth rate slightly lower than average for Europe's chemical industry which should hover around the 2% mark.

BP CHEMICALS BOOSTS PORTFOLIO

BP Chemicals International has become considerably enlarged with the addition of two new businesses, BP Advanced Materials and BP Detergents, to its portfolio. Total turnover of the enlarged company will be pound 2.5bn ($4.4bn). The assets, which add around pound 500m to sales, were transferred from within the BP group.

The advanced materials division comprises two subsidiaries—BP Advanced Materials Inc., responsible for the Americas and BP Advanced Materials Limited responsible for Europe and for developing the rest of the world. Turnover of the advanced materials business is budgeted to be $210m in 1988, with 80% of sales in the U.S. in aerospace, defence and high technology markets.

BP Detergents International was formed in 1980 through the amalgamation of several BP operations. The British company started detergent manufacture in Scotland in 1948 and made a significant move into the private label retail sector in 1976 with the acquisition of Robert McBride. This was followed by the acquisition of Belgium's Tensia in 1980.

A change of emphasis towards the household and personal care sector and away from pure detergents led to major acquisitions last year, including a Malaysian branded toiletries company. In the U.K. toiletries, cosmetics and washing powder companies were bought whilst in France, BP acquired branded shoe care, floor cleaner and toiletries firms.

In brief.....

* The Swedish chemicals and biotechnology group Fermenta AB has sold its US subsidiary Cedar Chemicals to New York based Nine West Corp. Cedar Chemicals produces and distributes a variety of potassum products. Potash mining is carried out through its subsidiary New Mexico Potash Co. Cedar's turnover in 1987 was $68m, and the company employs over 400 people.

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Chemical Markets Abroad

TIGHT METHANOL SUPPLY PROMPTS U.S. PLANT RESTARTS

Methanol markets have continued to tighten on both sides of the Atlantic during January and early February, despite earlier indications that they would remain balanced. Sustained demand for material for formaldehyde from resin producers and burgeoning demand for MTBE production has continued to shorten spot supplies and the long term outlook — so much so that plants are being recommissioned.

European prices for T2 material are now being quoted in the range DM300-310/ton fob Rotterdam ($176-182/ton) but observers predict that levels are poised to firm further. With increasing spot demand, T1 prices are steady at $155-165/ton but are likely to move up in the near future with reports that icing in the Baltic will begin to restrict Soviet supplic out of Ventspils.

In addition, production problems at the Tomsk 750,000 ton/year unit in Siberia, also as a result of cold weather, could herald the start of winter methanol shortages to NWE, giving an impetus to T1 spot levels, sources say. Last month, BASF brought back its 240,000 ton/year revamped methanol unit at Ludwigshafen in West Germany, but this will not ease European supply as the company intends to use production captively for formaldehyde.

With demand in Europe expected to grow at 3 or 4% this year, against 5% last year, producers are reported to be already running tight on contract volumes. Although European customers are not yet on allocation, continued shortage of spot material could boost contract levels significantly in the second quarter.

The market in Western Europe is mirrored in the U.S. where spot prices have topped 70 cents/gallon ($226-233/ton) compared with only 23-24 cents/gallon ($77-80/ton) this time last year. The tightness in the market has prompted Canada's Alberta Gas Chemicals to restart its third mothballed 180,000 ton/year unit at Medicine Hat which was closed in mid-1985 when the methanol market was in a state of depression. It will commence production at the end of February selling into the U.S., Pacific Rim and European markets. Last September, Alberta brought back its second 198,000 ton/year Medicine Hat plant which had been on stand-by for 15 months.

Ken MacRae, vice president of marketing at Alberta said the restart would cost the company some $300,000. However, he was confident of healthy demand for MTBE and formaldehyde in the future. The move has sparked off rumours that other plants mothballed during the methanol slump could be candidates for recommissioning, although sources suggest that the cost of restarting some units could top $20m. This sum, coupled with the difficulty in negotiating lengthy gas contracts, would deter producers from restarting older units observers say.

However, one U.S. major is understood to be demothballing a 600 000 ton/year methanol plant at Deer Park in Texas in the next three months, which will bring the plant officially on stream at the end of 1988. The company plans to use the methanol captively in acetic acid production effectively removing it from the buyers market. The plant will be run at a reduced capacity of 180,000 ton/year and will cost $3m to bring on stream.

In addition, global supply should ease later this year when Cape Horn Methanol brings its 748,000 ton/year plant on stream at Cabo Negro in Chile. Also scheduled to start up this year is a 85,000 ton/year plant in Iran for the National Petrochemical Company.

USSR FAILS TO MEET '87 TARGETS

The Soviet chemical industry failed to meet its target for the production of plastics, ammonia, sulphuric acid and caustic soda during 1987, the second year of its 12th Five Year Plan. Reporting on the industry's performance,the Communist party daily Pravda said that the ministry of the chemical industry failed to deliver Roubles 469m-worth or products. Enterprises of the light industry failed to receive 9,300 ton of chemical fibres and yarn.

The chemical sector, however, reported increases in the production of polypropylene, polystyrene, fibres and tyres.

Capacities commissioned during 1987 included 450,000 ton/year ammonia, 22,000 ton/year chemical fibres and yarn and 51,000 ton/year of plastics and resins. Included in these were an ammonia plant at the "Kemerovo Azot" enterprise and chemical fibres at the "Polimir" enterprise in Vitebsk region.

There are still 44 units which have not been commissioned out of a total 100 new units. The industry failed to commission an epoxy resins unit at the Leningrad research-production enterprise "Pigment", an ammonia unit at the Rossosh chemical plant in Voronezh region, a sulphuric acid plant at Balakovo works in Saratov

region and a superphosphate unit in Sumgait, Azerbaidzhan.

HOECHST-CELANESE REBUILDS PAMPA

Hoechst-Celanese Chemical-Company in the U.S. has named Fluor Daniel as the contractor to rebuild its acetic acid plant at Pampa in Texas.

The 250,000 ton/year plant, which was badly damaged by an explosion and fire on November 14 last year is expected to be on production by the end of 1988, although the rebuilding will not be totally completed until late 1989.

At the time of the incident the company declared *force majeure* on all its contracts. This still exists although the company plans to bring four production lines up on a temporary basis using imported generators next month. The products are; methyl acrylate, 2-ethylhexyl acrylate, ethyl acetate and multifunctional monomers. Hoechst Celanese said its 400 employees at the site have been retained.

POLES INCREASE SULPHUR EXPORTS

Poland, one of the world's largest producers and exporters of sulphur, exported over 4m ton of the mineral last year. Its production runs at around 5m ton/year. Wladyslaw Szczepankowski, general director of Ciech, the organization responsible for trade in sulphur, said that sulphur represents a profitable business. Production costs for each ton of sulphur reach zl 12,000 while sales top the zl 30,000/ton mark.

Each year Poland receives $205m and Roubles 180m for its sulphur. On average Polish sulphur sells for $145/ton, against $135/ton for Canadian, $136/ton for U.S. and $120/ton for Arab product. Szczepankowski was speaking to the trade unions weekly Sprawy Chemikow.

TiO_2 PRODUCERS BULLISH DESPITE SURPLUS FEARS

Titanium Dioxide producers, on the whole, remain optimistic about future markets, despite uncertainty over the world economy and rumours of approaching overcapacity. Following a boom year in 1986, pundits estimated growth would slow to 2% in 1987. However most regions experienced much higher increases in demand. Sources quote figures of 8-9% in Europe and 6.5% in the U.S., averaging out at 7.5% globally. This year the market for titanium dioxide is expected to be reasonable, with demand growing at around 4-5%. Supply increases are between 2-2.5%.

Du Pont, the largest titanium dioxide producer, expects demand to remain strong. Dick Romanelli, Director of the international operation for the company's white pigment and mineral products division, claims that plants are currently being run full out. Since 1987 when Du Pont produced 540-550,000 ton, output has increased to 570-580,000 ton through debottlenecking projects. A further 30,000 ton should be squeezed out this year. In the US, titanium dioxide is selling at between 80-90 cents/lb depending on grade and quantity. Du Pont imposed price increases last October of 3 cents/lb. It says this reflected inflatory cost increases and a percentage to cover debottlenecking projects.

Separate sources claim the product is in such short supply as an unofficial market is operating in the US and Latin America, sealing titanium dioxide at a colossal $2/lb. Elsewhere prices are quoted at Pound1300-1345/ton in the UK. European titanium dioxide costs around Pound 100/ton more, with base prices in the order of Pound 1370-1380/ton. In the Fast East prices are around $2150/ton and in the US $2400/ton. According to one producer, limited price discounting has been reduced in the US, and specialist grades of titanium dioxide obtain high premiums.

Du Pont is currently considering a new 90,000 ton facility in the US to meet strong demand. Its 60,000 ton/year plants planned for Taiwan, South Korea and Brazil are still awaiting authorization, which is expected soon. It will take up to four years to build the units. The company claims that these plants will not cause a glut as the three plants would come on stream gradually.

Commenting on the possibility of a recession hitting business, Romanelli, says that Du Pont aims to be in titanium dioxide long term, and although there are bound to be recessionary times they will not last long he said.

Tioxide, number two in the world titanium dioxide ranking, is less optimistic. Although it notes that the market is still tight, the company expects demand to steady this year, with extra capacity coming on line in 1990. Tioxide has no major plans for new plant. However, it has improved processes to get an extra 150,000 ton/year on top of outputs of between 430,000-440,000 ton/year in 1987.

SCM Chemicals, which by the end of this year will be producing 391,000 ton/year of titanium dioxide, believes that demand is still sufficient to absorb new capacity coming onstream in the near future. Other expansions mooted by Saudi Arabia and also the Du Pont plants were some considerable time away. SCM is undertaking expansion at its Bun-

bury, Australia and Ashtabula, Ohio plants. It also increased prices last October in the UK but the company's international business director says further rises are unlikely this year.

Commenting on stock levels, SCM compared the present situation with that of 1984. Then demand in Europe grew by just under 1m ton/-year, with stocks standing at 90,000 ton. Today stocks are at a similar level but demand in Europe is set to increase by over 1.1m ton this year.

Salomon Brothers recently predicted uneasy prospects for titanium dioxide with the threat of overcapacity. Since the report Salomon analyst Mark Quilliam comments that a recession in 1989 looks even more likely, although 1988 should be fair. On the positive side, he said that because there were few players price discipline should be greater. If a downturn occurs Quilliam noted that a delay in debottlenecking and new projects would be seen.

BECHIMEX OPENS MOSCOW OFFICE

Brussels-based Bechimex, set up to promote trade between the Belgian chemical industry and state controlled economies, received official agreement on February 3 for the opening of an office in Moscow.

The company is the first Belgian concern to win accreditation with the Soviet state committee for science and technology. The request was lodged in 1982 and Bechimex says the speed with which approval was granted illustrates the interest Soviet authorities have in strengthening their ties with the Belgian chemical industry.

Chemviron, Petrofina, Solvay and UCB are already using the services offered in Moscow and several other companies have expressed a firm interest.

In brief.....

* Eastman Chemical International has appointed fine chemicals distributor Unipex to distribute its products in France including antioxidants and food additives.

* The Qatar Fertilizer Company has cut its 1987 losses by $3.3m and is on target for profit in 1988. However, the company was reluctant to reveal its losses in 1986, on which the figure is based. The improved results are partly attributable to an 8% reduction in the workforce. The company's ammonia production during 1987 rose to 682,000 ton although urea output dropped to 734,000 ton. India bought the most ammonia at 90,000 ton, followed by France with 30,000 ton.

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In the European Market*

Naphtha prices rose slightly to $152-154/ton cif.

Ethylene prices stabilized at $400-410/ton cif. With BP's Grangemouth cracker back on stream and Repsol and DSM fully operational there was plenty of product available in Europe and the ARG pipeline was reported to be full. Three UK majors were looking for product. Exotic material from Libya and Saudi which had been sold to cover producer shortfalls proved the only real business.

Few propylene deals were concluded in NWE and the Med and "academic" numbers remained in the range DM550-560/ton cif. Some Libyan product destined for BASF's troubled oxoalcohols plant had been diverted to the Far East. Buyers' and sellers' ideas were still some way apart with the former looking at DM520/ton and the latter asking for DM575/ton.

Butadiene prices tumbled again to $300-320/ton prompting producers into co-cracking, but cracker turnarounds planned for April could shorten supply. US storage tanks were full and although spot prices were being quoted in the range 21-22 cents/pound one European trader could not sell below 20 cents/pound.

A sudden surge of aromatics activity in Rotterdam sent benzene prices to $330-340/ton with numbers as high as $350/ton heard. Buyers were taking long positions in anticipation of spring shutdowns at Exxon, DSM and Veba.

March contracts were settled in the US by Shell at $1.05/gallon and Exxon at $1.10/gallon but with low inventories and supply shortages spot levels were considerably higher at $1.10-1.20/gallon.

With gasoline prices rising at around $1/ton a day, toluene firmed to $260-270/ton. In the US, producers were buying at 87-90 cents/gallon for HDA conversion and gasoline blending.

US isomer demand was having a knock-on effect on Europe's xylenes market, lifting levels to $255-260/ton for virgin and $245-250/ton for solvent.

Paraxylene prices continued to astound the market, up by around $100/ton on last week to $550-570/ton, with $600/ton heard. The market remained 'firmly balanced'. Orthoxylene was left behind and in a quiet week numbers touched $320-330/ton.

Styrene suddenly firmed midweek with T1 quoted in the region $1575-1585/ton. A 1,000 ton parcel was sold at $1583/ton fob Rotterdam for delivery in the first half of March, which traders believe could be part of a 10,000 ton Soviet package. 6,000 ton was sold at $1640/ton cif out of Rotterdam for South Korea. This, traders reckon, would halve spot volumes available in Rotterdam. The US market was still tight although spot volumes have not moved off 71-72 cents/pound.

The European methanol market remains balanced with T2 prices at DM290-295/ton and T1 holding at $155-165/ton.

Despite some reports of ice in the Baltic, Soviet product was moving out of Ventspils freely, keeping supplies stable in Rotterdam.

** Analysis of spot prices prevailing in the first week of March 1988.*

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News from the American Market

OXYCHEM WILL BUILD AN EDC PLANT

The vertifical integration strategy that has driven Occidental Chemical (OxyChem) to purchase chlor-alkali plants and polyvinyl chloride (PVC) facilities at times when other companies were eagerly exiting from the businesses is key to the company's announcement that it will complete an 800-million-lb/year ethylene dichloride (EDC) plant at Corpus Christi, Tex., by the second quarter of 1980. Chlorine feedstock for the new plant will come from the idled Corpus Christi chlor-alkali facility that OxyChem purchased from Du Pont last fall. The Corpus Christi plant will restart in the second quarter and should be ready to produce at its capacity by year-end. EDC is used primarily to produce vinyl chloride monomer, a precursor of PVC. OxyChem is moving nearer to expanding its PVC suspension resin capacity at Pasadena, Tex. The company recently applied to the Texas Air Control Board for a permit to boost output. OxyChem earlier conducted a study on whether to increase capacity at Pasadena by 200 million lb/year, to slightly more than 1 billion lb/year.

SAN PRODUCTION AND SALES SKYROCKET

U.S. producers of styrene acrylonitrile (SAN) resin last year boosted production by 50.6%, to 123.2 million lb, compared with output in 1986, and increased sales 49.3%, to 117.3 million lb, according to the Society of the Plastics Industry. The jump in production and sales, says a producer source, resulted from a substantial increase in exports driven by the weak dollar and the rising cost of styrene monomer abroad. Sales in the Pacific Rim were particularly brisk, he says, because plastics moulders found that imported resin made with lower-priced styrene was cheaper than SAN sold by local suppliers. the price of styrene in Asia is 65¢/lb, compared with 42¢/lb in the U.S. SAN resin exports through November 1987 reached 30.7 million lb, up 163.6% from the year-earlier period.

EXXON INCREASES ITS ETHYLENE CAPACITY

Exxon Chemical will debottleneck 120,000 metric tons/year of ethylene capacity at plants in France and the U.K. by mid-1989. Exxon Chemicals Ltd. will boost capacity at Mossmorran, Scotland, by 100,000 m.t./year, to 600,000 m.t.year, by building a 50,000 m.t./year furnace and making modifications at the site. Societe Francaise Exxon Chemical will increase the capacity of its 300,000 m.t.year plant at Notre-Dame-de-Gravenchon, to 320,000 m.t./year. The French subsidiary is considering a further 80,000 m.t./year expansion, provided it can find users for the material near the plant in the Le Havre area. Exxon is confident it will find local use for ethylene produced in France, even though the company currently exports ethylene from France to Antwerp. That implies that either a major new ethylene-consuming plant is planned near Le Havre or some ethylene capacity will be closed. Exxon says that such incremental increases in ethylene capacity may make new plants in Europe unnecessary. Exxon, along with other producers, has criticized Neste and Petrofina for undertaking a project to build a 450,000 m.t./year ethylene plant at Antwerp.

U.S. BENZENE AND OLEFINS OUTPUT JUMPS

U.S. benzene production in 1987 reached 1.6 bil. gal, 13.9% above output in 1986, the National Petroleum Refiners Assn. (NPRA) reports in its year-end survey. While NPRA does not offer interpretation of data, observers ascribe much of the rise in benzene production to a booming export market for benzene derivatives, particularly styrene. Production of benzene by dealkylation of toluene rose 19%, to 401.69 mil. gal, because of the restart of a number of idle units. Benzene output as an ethylene coproduct fell 3.6%, to 327.45 mil. gal, as producers sought to maximize ethylene production. The leading source of benzene in the U.S. remained reformate extraction, accounting for 830.2 mil. gal of benzene last year. After peaking at midyear, benzene prices declined and stabilized. Reflecting that, output in the fourth quarter was down 8% and inventories rose 15.5%, to 158.1 mil. gal. NPRA classifies roughly 15%, 23.4 mil. gal, of benzene stocks as "nonusable".

U.S. olefins plants operated at close to peak capacity all through 1987, the National Petroleum Refiners Assn. (NPRA) says. Ethylene production reached 34.84 mil. lb, up 6.2%. Plant operating problems in the fourth quarter are reflected in a 1.7% output drop from that of the third-quarter, to 8.93 bil. lb. Recovering 3.3% from the two-year low to which they sank in the third quarter, ethylene inventories rose to 1.19 bil. lb at year-end. NPRA estimates that 120 mil. lb of ethylene in store is not usable. About 74% of total ethylene output was based on natural gas liquids, compared with 69.4% in 1986. In fourth-quarter 1987, propylene inventories rose 65%, to 995.45 mil. lb. Propylene output from olefins plants in 1987 jumped 6.4%, to 10.27 bil. lb. Production from refinery sources grew 27% to 7.41 bil. lb.

Fueled by strong elastomer export demand, butadiene output last year rose 14.8%, to 2.84 bil. lb.

Technological Scene Abroad

A NEW TEAM FORMS IN RESPIRATORY DISEASE RESEARCH

A better understanding of respiratory disease is the aim of a $2.2 million, five-year collaborative research agreement between Johns Hopkins University School of Medicines (Baltimore) and SmithKline Beckman. The goal is to improve the diagnosis and treatment of allergic and inflammatory respiratory diseases such as bronchial asthma, chronic bronchitis, cystic fibrosis and emphysema. SmithKline will have first right of refusal to license any patented processes or products that result from the collaboration. SmithKline brings to the agreement expertise in drug development, molecular biology and protein chemistry, while Johns Hopkins has long been recognized as a leader in research on allergies and respiratory diseases.

GENETIC ENGINEERING OF A CHEESE ENZYME

Genetically engineered rennin --the enzyme that clots milk in cheese making -- is the subject of a licensing agreement between Celltech (Slough, U.K.) and Pfizer. Pfizer will license two Celltech patent families that cover key steps in product purification and gene expression of rennin. Celltech, for its part, will receive undisclosed lump sum payments and a royalty on Pfizer sales of rennin. The Food and Drug Administration (FDA) is reviewing Pfizer's application to market genetically engineered rennin. Pfizer says that the application is the first one reviewed by FDA that involves a food additive produced by fermenting a genetically engineered organism. The current market for rennin is estimated at $50 million/year.

TREATMENT FOR THE COMMON COLD AWAITS TESTING

Nova Pharmaceutical (Baltimore) has filed an investigational new drug application with the Food and Drug Administration to test a novel approach to treating symptoms of the common cold. The approach involves a drug that blocks bradykinin, which is the most powerful pain-producing compound in the human body and has been found at high levels in nasal secretions associated with the common cold. The Nova drug, known as a bradykinin antagonist, is in the form of a nasal spray and aims to reduce such cold symptoms as sore throat and nasal congestion.

A BRAZILIAN AUTO PART MAKER SEEKS A U.S. R&D BASE

Following the lead of U.S. auto part suppliers, Brazil's Metal Leve, a big exporter of parts into the U.S., will open a $3 million research and development (R&D) facility at Ann Arbor, Mich., by midyear. Using the new center as a base, the company will work with the University of Michigan and the Battelle Institute to develop ceramic fibers and coatings for its pistons and sleeve bearings, and later to develop monolithic ceramic pistons of silicon nitride and silicon carbide.

JAPAN HAS A NEW COMPOSITE ENTRY

Mitsui Petrochemical Industries (MPI), Tokyo, will build a 3,000-metric-tons/year plant to make MCX-A glass-fiber-reinforced aromatic polyimide at its Ohtake, West Honshu, works by December. The composite, developed primarily for the automotive and electronic markets, can withstand temperatures as high as 320°C. As a result, it can be soldered in a bath, a process required by auto part makers for production of pulleys and other engine peripherals. MPI also expects MCX-A to be used in coils, connectors and motor parts.

CHEAP ANALYSIS OF WASTE TREATMENT OPTIONS

General Electric (Fairfield, Conn.) is offering a computer program that analyzes the finances of various waste treatment and disposal options. The single-copy, use license fee is $20-100, including skeleton documentation. The idea behind the low price tag is the hope that users will take the seed concept, improve the model, share the results, and generally foster cost-effective waste minimization.

DIAMONDS FOR CURVED SHAPES

Showa Denko KK (SDK), Tokyo, has begun experimental custom production of diamond crucibles and other products with curved surfaces at its Omachi Research Laboratory (Omachi, Nagano). A pilot plant at the laboratory can produce "parts with free shapes from diamond polycrystal," SDK says. The company plans to sign a licensing pact with the government's Research Development Corporation of Japan to obtain the right to use the basic patents of the National Institute for Research in Inorganic Materials (Tsukuba).

The institute's diamond technology includes production from methane and other gases by chemical vapor deposition. SDK expects to make such products as bearings and other machine parts, anticorrosion crucibles, medical instruments and lenses.

News from Japan

Two Drug Makers set up R&D Bases in Europe

Two major Japanese drug makers — Takeda Chemical Industries, Ltd., and Tanabe Seiyaku Co. — established February 1 their R&D bases in Europe in a bid to pioneer new drugs there by themselves and help their European subsidiaries push forward R&D work.

Takeda Chemical has set up a new-drug development center in Frankfurt, W. Germany. It is staffed with eight members including researchers and local employees and will inaugurate full-scale business activities April 1. It will support R&D work conducted by Takeda's three joint ventures with European interests — Laboratories Takeda (France), Takeda Pharma (W. Germany) and Takeda Italia Farmaceutici (Italy) — and Glaxo (Britain), with which the Japanese company has concluded a joint R&D agreement.

The new R&D center will be systematically combined with the company's central laboratory and medical/international divisions and serve as a foothold for its R&D work in Europe.

In a related development, the company on the same day changed the name of Takeda GmbH (W. Germany) into Takeda Europe GmbH and established the German subsidiary's branch within the new R&D center. The branch office will supply Takeda Chemical's bulk pharmaceuticals to the three European subsidiaries and will be managed in combination with the R&D center.

In the United States, the Japanese drug maker has established TAP Pharmaceuticals jointly with Abbott, thereby setting up a new-drug development system.

On the other hand, Tanabe Seiyaku has opened a development office in Brussels, Belgium in an attempt to help its two subsidiaries — RP Tanabe (France) and Tanabe-Glaxo (Switzerland) — speed up their R&D activities. The new office is staffed with four members including two Japanese researchers and two local people.

RP Tanabe and Tanabe-Glaxo are developing a few items of circulatory-organ medicines and cephem antibiotics, respectively. In the States, Tanabe Seiyaku has established Tanabe-Marion Laboratories in partnership with Marion (US).

To date the Japanese company has promoted overseas operations in such a manner that it supplies foreign companies with production technology for, in particular, "Herbesser" calcium antagonist and "Hopate" cerebral metabolism activator and with bulk pharmaceuticals. This method, however, suffers from inefficient, slow development of new drugs abroad.

Japanese drug makers are aggressively selling their self-developed products on the world market, taking into account cut-throat sales competition on the domestic market, successive reductions of Japan's drug tariff and mounting R&D expenses. To this end, they once concluded cross-license agreements and established joint companies with foreign companies but have recently moved toward setting up R&D bases abroad. Most such R&D bases have hitherto been located in the States but the above mentioned steps taken by Takeda Chemical and Tanabe Seiyaku will encourage other domestic drug makers to take similar steps in Europe.

PVC Production in 1987 Sets Record

Both production and deliveries of polyvinyl-chloride (PVC) resin in 1987 exceeded the 1,600,000-ton level, hitting all-time highs.

Supported by the government's domestic-demand promotion policy, demand for PVC resin for use in rigid and flexible PVC products, electric wires and other items was brisk and all uses registered all-time records.

Reflecting the favorableness of PVC business, consumption and deliveries of vinyl chloride monomer (VCM), raw material for PVC, both recorded 1,650,000 tons, also hitting all-time highs.

Production and deliveries of VCM in 1987 were next to those of VCM in 1979 when VCM production and deliveries hit the previous all-time highs.

Mochida and Taisho Link in Anti-athlete's foot Drug Sale

Mochida Pharmaceutical Co. and Taisho Pharmaceutical Co. have reached agreement to tie up with each other in sales of an OTC drug effective against tinea pedis (athlete's foot), etc.

The drug is based on the "FLORID D" ethical drug produced by Mochida using Janssen (Belgium)'s technology as an antitrichophyton agent. It has miconazole nitrate as an effective ingredient and a strong effect against trichophyton which causes tinea pedis and tinea cruris as well as Candidiasis.

The tie-up agreement allows Mochida to gain greater access to the Japanese OTC-drug market and Taisho, Japan's top OTC-drug maker, to market a prominent OTC drug against athlete's foot.

Taisho will soon market the drug under the "Dermarin" and "Dermarinsol" trade names. With the new brand, Taisho, which holds the 3rd largest share in the Japanese anti-athlete's-foot drug market, intends to become the top shareholder in this field by expanding its sales of anti-athlete's-foot drugs, now a little more than Y1.7 billion a year, to Y3 billion.

S'pore Govt. To Sell Shares In Pet'chem. Project To Shell

Japanese investors in the Singapore petrochemical project have been embarassed by the Singapore government's decision to sell all its shares in the project to Shell group companies acting as an international oil major. The government made the decision last August and has called on Sumitomo Chemical Co. — the leader of the Japanese investors — to consent to the decision.

The Japanese government has participated in the project via its financial institution, Overseas Economic Cooperation Fund. Temasek Holdings and Singapore Development Bank are owned by the Singapore government.

The Singapore government has decided to transfer government-backed corporations to the private sector. It is believed that Shell proposed to the government to buy all its shares in the said project in a bid to promote petrochemical operations in Southeast Asia. Shell has a 500,000-bbls/m oil-refining plant in Singapore and owns 20% of the shares in Ethylene Glycols (Singapore).

The project was inaugurated in the Singapore government to the Japanese government. In the initial stage many Japanese companies were reluctant to participate in the project since they had doubts about its profitability but finally did so because the Japanese government financed it.

If the Singapore government sells all its shares in the project to the Shell group, the project will no longer be a "government-level" project. In addition, the group will be the largest shareholder in the project and the Japanese side may lose leadership.

Business operations of the petrochemical project have gone into the black thanks to the tight supply-demand situation for petrochemicals throughout the world and growing demand for the products in Asia but Sumitomo Chemical and other Japanese investors claim that the project needs continued support from the Japanese and Singapore governments.

The Singapore government is pushing the Japanese side to reply as soon as possible but the latter has yet to reach a conclusion on the matter.

Sekisui Chemical Builds Up Its U.S. Subsidiary

Sekisui Chemical Co. has incorporated its office in the USA into Sekisui America Corp., its American subsidiary. The office once collected technical information and conducted M & A business in the United States.

Sekisui Chemical has introduced production technology for flexible/rigid printed circuit boards from the States via the office. The subsidiary is producing/marketing plastic pipes and foamed polyethylene.

In a related development, the Japanese company has established Sekisui (Europe) AG in Switzerland in a bid to step up business operations in Europe. The subsidiary is scheduled to introduce production technology from European concerns and establish a production base somewhere in Europe in a team-up with the parent company's development promotion division. It supervises Sekisui Chemical subsidiaries establishments in several European countries.

MBS Resin Production Capacity Scaled Up In U.S.

Kaneka America Corp. — U.S. subsidiary of Kanegafuchi Chemical Industry — has scaled up its production capacity for methacryl butadiene styrene (MBS) resin from 12,000 to 26,000 tons a year.

The additional plant construction will help the company promote MBS-resin operations in the States amidst the yen's appreciation against the dollar, though growth of MBS-resin demand in the country is tending to slow down as in the case of Japan, reflecting growing demand for PET resin.

The parent company will continue to export special-grade products to the States and the U.S. subsidiary will slightly increase the number of MBS-resin grades it offers in a bid to satisfy diversified user needs.

Kanegafuchi Chemical tackled development of transport, shock-resistant plastic bottles for mineral water — a daily necessity in Europe — commercialized MBS resin in 1963. Since then the product has been exported all over the world.

News About New Projects

BP CHEMICALS REVEALS PE INVESTMENT IN THE U.K.

BP Chemicals International, Europe's second largest producer of polyethylene, has announced a pound 60m ($106.2m)-plus polyethylene expansion programme in the U.K.

Included in the plan is the company's long-mooted project at Grangemouth, Scotland, the first in the U.K. to produce higher alpha-olefin linear low density polyethylene copolymers using the BP Chemicals gas phase process. The new 125,000 ton/year plant will replace the 90,000 ton/year conventional low density polyethylene plant acquired from Union Carbide Corporation in 1979.

The company has revealed that plans are also at an advanced stage to increase BP Chemicals' high density polyethylene capacity at Grangemouth by recommissioning a mothballed plant. This project will increase capacity by 100,000 ton/-year from the 1986 level, bring it to 250,000 ton/year over the next two years.

This plant, originally equally owned by Distillers and BP, uses the Phillips' hdPE process. The decision to recommission the plant was taken because of demand and cost considerations. It is cheaper to revamp an existing unit than build a new one.

The lldPE project is expected to be completed by the end of 1989. Contractors will be appointed shortly, the company says. BP Chemicals has two preferred contractors when licensing its process — Foster Wheeler and Technip. Basic design on the Grangemouth plant has been carried out by Foster Wheeler, it is believed.

Higher alpha olefin lldPE compolymers use 4-methylpentene-1 (4MP1) comonomer from a recently commissioned plant at Grangemouth.

Current U.K. PE capacity amounts to just over 400,000 ton/year against a total domestic market of nearly 1m ton/year. This expansion will maintain BP chemicals' position as the leading producer and supplier of PE. It will also improve security of supply to the U.K. plastics process industry, the company says.

BP and Shell are the U.K.'s only producers of PE. The 310,000 ton/-year produced by BP is split between the following capacities; 150,000 ton/year hdPE and 90,000 ton/year ldPE at Grangemouth and 70,000 ton/year of ldPE at Wilton. Shell's 105,000 ton/year ldPE plant, which is working at below capacity, is based at Carrington.

BP Chemicals' global PE capacity is currently 885,000 ton/year. Its U.K. tonnage is supplemented by 300,000 ton/year ldPE from Erdolchemie in Worringen, West Germany, where it still plans to build a 100,000 ton/year lldPE plant. Another 135,000 ton/year ldpe plant is operated at Antwerp and a 140,000 ton/year hd-to-lldPE plant at Lavera in France.

On completion of the new projects the company's total polyethylene capacity will increase to 1.135m ton/year and BP could overtake Enichem, Europe's current leader. The Italian producer plans a 500,000 ton/year PE joint venture at Tenghiz in the Soviet Union, however. With a total capacity of 1.14m ton, BP is well placed for ethylene supplies. At Grangemouth it has 250,000 ton/-year and Baglan Bay 340,000 ton/-year. Its 20% share in the 650,000 ton/year Wilton cracker gives it a further 130,000 ton/year in the U.K.

In Germany it has a half share in the 360,000 ton/year Erdolchemie cracker and in France another 50% of a 480,000 ton/year ethylene capacity at Lavera.

HdPE is used in the manufacture of blow-moulded containers, water and gas pipe and lldPE to produce plastic films for packaging and in wire and cable insulation. Demand has outstripped supply recently and prices for these polymers have been substantially higher, allowing good profits to be made after years of overcapacity and losses.

ALMA PROCESS FOR SHIN-DAIKYOWA

Japan's Shin-Daikyowa Petrochemical Company has selected the Alma process, developed by Alusuisse Italia and Lummus Crest, for the production of maleic anhydride from n-butane.

Lummus has completed basic engineering for a 15,000 ton/year unit for Yokkaichi-based Shin-Daikyowa. It will be the first fullscale plant using the new Alma process. Alusuisse Italia will provide the catalyst and Toyo Engineering is performing detailed engineering, procurement and construction for completion in late 1988.

The process was selected for its economic and production advantages which derive from the fluidized-bed technology and from a continuous non-aqueous recovery system.

Alusuisse Italia, a subsidiary of Alusuisse Limited of Switzerland, is

a leading producer of maleic anhydride, phthalic anhydride and derivatives as well as supplier of technology and catalysts for these industries. The Alma process has been successfully demonstrated on a semicommercial unit at Alusuisse Italia's facilities in Scanzorosciate.

KOBE TEAM WINS KURSK CONTRACT

A team led by Kobe Steel of Japan has won its second polyester fibre order in the Soviet Union. The $140m (Yen 18bn) contract covers the construction of a 50,000 ton/year polyester staple fibre plant at Kursk, 460km southwest of Moscow. It was won against stiff competition from Davy McKee/Zimmer and Uhde/-Hoechst.

Included in the consortium are Du Pont and Chemtex of the U.S. and the Japanese trader Nissho Iwai. Du Pont will provide knowhow for the plant and Chemtex will carry out the engineering and supply the critical equipment items. Nissho Iwai will take responsibility for financing and buyback arrangements. Products offered include methanol, ammonia, ldPE, hdPE, PS, PVC and benzene. The consortium could take the option of paying a penalty to Sojuzchimexport instead of taking products, however.

The Kursk plant will be fed on polyester chips from the Blagoveshchensk complex in Bashkiria. The contract to build that complex went to the Kobe Steel consortium in May 1987. This consortium also included Chemtex, Du Pont, Mitsui & Company, Mitsui Engineering & Shipbuilding, Ciba-Geigy and Voest Alpine.

The Blagoveshchensk complex will comprise plants for 230,000 ton/year of purified terepthalic acid (xylene from Ufa), 110,000 ton/year polyester polymer, 50,000 ton/year *Dacron* polyester staple for apparel and fibre fill, and 20,000 ton/year of *Typar* polypropylene spunbonded fibre for use in carpet backing, bale wrapping and geotextiles (used to make roads).

"We are very disappointed", a source at Davy said. Davy's DM-denominated quote was equivalent to $135m, slightly cheaper than Kobe's. The three teams are now competing for the third polyester fibre contract. An enquiry for a brand new complex at Mogilev was issued in September. The project calls for the construction of plants to produce 50,000 ton/year of polyester polymer, based on PTA from Blagoveshchensk, and 50,000 ton/year of polyester staple fibre.

CITRIC ACID HIKE

Miles Inc., a subsidiary of Bayer, is to expand production of citric acid by 22,700 ton/year. Each of the company's existing production facilities will be expanded.

Miles operates citric acid plants in Elkhart, Indiana and Dayton, Ohio in the U.S., in Mexico, Colombia and Brazil. The company has developed advanced technology to produce citric acid which allows the use of a variety of carbohydrate feedstocks including corn, cane sugar and wheat.

FINANESTE INVITES BIDS FOR CRACKER

Belgium's Petrofina and Neste of Finland have confirmed plans to build a major ethylene cracker in Antwerp, Belgium.

The partners will invest nearly BF20bn ($573m) in Finaneste, a new company owned 65% by Petrofina and 35% by Neste. Finaneste will build a cracker with a capacity of 450,000 ton/year of ethylene on the left bank of the Scheldt river.

Three contractors—Stone & Webster, Lummus and MW Kellogg—have been invited to bid for the complex which is due to begin production at the start of 1991.

Finaneste has taken over Petrochim's two crackers and auxiliary plants and will debottleneck these units so that by early 1991, Finaneste's total ethylene capacity will increase to 1m ton/year. This, say the partners, will open up new development prospects for Belgium's petrochemical industry.

In particular, its proximity to refineries guarantees Finaneste optimum feedstock supply conditions just as its connection to main European pipelines enables the company in turn to supply numerous plants in Belgium, West Germany and the Netherlands.

The venture will allow Neste to secure ethylene and propylene supplies for its plants in Finland, Sweden, Belgium and elsewhere. Finaneste does not include Petrochim's polyethylene and rubber production activities in which Petrofina retains its holding.

The partners remain quiet on what will be done with the extra tonnage. Petrofina says it will sell some of its share on the market.

Much of Neste's share of ethylene and propylene is accounted for and the Finnish producer may increase its Porvoo polyethylene capacity in the future. Neste has not yet finalized plans for its share of C_4 and C_5 fractions.

An announcement on Neste's proposed styrene project at its Porvoo, Finland site is expected in a few weeks.

New Developments from Japan

High-performance Dispersant For Coal-Water Slurry Bared

Japan Synthetic Rubber Co. has developed a high-performance dispersant for high-concentration coal-water slurry (CWS). A related pilot plant aimed at pioneering a low-cost manufacturing process has been built at the company's Kashima factory, utilizing a subsidy from MITI's Agency of Industrial Science and Technology.

The new dispersant is produced by sulfonating dicyclopentadiene — which is contained in C_5 fraction obtained through naphtha cracking — and polymerizing the resultant product. The product can easily be modified through copolymerization with other kinds of monomer and its molecular weight can also be easily controlled. It is possible to make the product suitable for any type of coal.

A CWS dispersant ensures unifrom dispersion of coal particles and low viscosity of CWS and stabilizes CWS quality for a long time.

Conventional CWS dispersants are produced from condensates of napthalenesulfonic acid and polystyrenesulfonic acid. Their properties, however, are not constant with every type of coal and what is worse, they are expensive.

To date most dicyclopentadiene has been used as fuel and partly employed as raw material for petroleum resin. The company has examined efficient use of the product.

CWS consists of coal particles, water (approximately 30%) and a very small amount of dispersants. It can be handled in the same manner as in the case of fuel oil and be directly burnt. Unlike coal, it calls for no wide storage site. It is regarded as a promising oil alternative which will serve as a steady energy source. Practical use of the product depends on development of high-performance dispersants.

200-t/y Zirconia Powder Plant Completed: Tosoh

Tosoh Corp. has completed the world's largest plant for partly stabilized zirconia (PSZ). The new plant is located at its Nanyo factory in Yamaguchi Prefecture and is capable of producing 1,000 tons a year of zirconium oxychloride (ZOC) — raw material for PSZ — and 200 tons a year of PSZ from zircon sand imported from Australia.

PSZ — categorized as a fine ceramic — has high strength and tenacity, corrosion and abrasion resistance and low thermal conductivity. Global demand for the product stands at 150 tons a year, with consumption centered on the Japanese market. It is certain to reach 300 tons in the near future due to sharp demand increase in Japan, the States and Europe.

The company will continue trial operation of the new plant until the end of February and start supplying the product to users both at home and abroad. To date it has operated 60-t/y semicommercial plant but has not been able to meet growing demand for the product.

ZOC has hitherto hardly been produced in Japan and the company has used imported products. It has sometimes found it difficult to stabilize product quality using imported raw material but self-supply of ZOC will help improve the product quality of its PSZ. It envisages supplying ZOC to domestic zirconia-chemical companies as well as consuming the product itself.

The new plant will, the company claims, bring about economy of scale and cost competitiveness since it is located in the Nanyo factory which provides utility services and subordinate raw material — acid and alkali — on favourable conditions.

Shaped Diamond Parts Made For First Time By Shoden

Showa Denko K.K. (Shoden) has, for the first time in the world, succeeded in manufacturing diamond parts having curved surface such as pipes and crucibles and has begun shipments of samples to users.

The pure diamond polycrystal parts have been made by means of chemical-vapour-deposition application using methane and other organic gases developed by Shoden. Parts now being produced by the company have comparatively simple shapes but it is preparing to make diamond parts with complex shapes by improving and expanding its production facilities which are now on a trial level.

The development is the result of R&D efforts Shoden has made since 1983 under the direction of Dr. N. Sedaka of the National Institute for Research on Inorganic Materials.

The manufacturing method is to crystallize diamond on base materials such as copper and silicon in a reactor in which organic gases including methane and alcohol diluted by hydrogen are excited by high-frequency waves, microwaves and electron beam, and then the base materials on

which the diamond has been crystallized are removed therefrom by means of liquid or vapour acid, resulting in pure diamond parts. The company says this process makes it possible to produce pipes with a thickness of 100 microns and a diameter of 1-10mm and crucibles with a diameter of upto 6 cm.

It says the new diamond parts will be used effectively as high abrasion-resistant bearings, sliding parts operating in vacuum, water-jet nozzles, thermocouple protective tubes and highly anti-corrosive crucibles as well as tweezers, forceps, scalpels, optical lenses and audio-equipment parts.

Wacker-Chemie To Produce Silicon Wafers In Japan

Wacker-Chemie (W. Germany) is planning to build in Japan slicing/polishing facilities for semiconductor-use silicon wafers at a total cost of Y15,000 million, with start-up of the facilities scheduled for early 1990. The company will immediately inaugurate related engineering work.

It aims at expanding its market share for silicon wafers throughout the world. In this direction, it has decided to build a production base in Japan. In addition, it has consolidated its business foothold in the United States.

The West German company's total sales last year amounted to DM2,800 million. Silicon Chemicals such as high-purity silicon and silicon products accounted for 60% of the total figure.

Wacker-Chemitronic GmbH affiliated with Wacker-Chemie is producing and marketing high-purity silicon. The subsidiary company built last year a new chlorosilane plant and scaled up production capacities for polycrystal silicon and epitaxial wafers.

In Japan, Wacker-Chemie has established Wacker Chemicals East Asia Inc. in partnership with Hoechst Japan Ltd. The joint company imports silicon wafers for domestic sales and scaled up last year its laboratory located in Yokohama in a bid to improve technical service and applied-research capability.

Heating-Panel Company Jointly Established

Kawasaki Steel Corp., Ceramic Giken Co. and Chori Co. have established a 70/20/10 joint company named Kawasaki Fine Heater Corp. The joint company will develop and manufacture heating panels and extreme-infrared-radiation heaters, both of which will be marketed through Kawasaki Steel.

The new company is located in Sakaiminato, Tottori Prefecture and will use Ceramic Giken's production facilities.

The targeted heating panel consists of cotton textile, on which fine particles of conductive carbon in an extremely small quantity are uniformly coated.

It features uniform heating, wide heating area, self-control of heating temperature, high heating efficiency and small electric-power consumption.

It has been extensively used for melting snow lying on the roofs of houses located in cold areas, heating building floors, household heating (in form of electrical carpets and mats), and agricultural fields including nursery heating, etc.

The current market size for heating panels stands at Y10,000 million and will reach Y30,000 million five years hence. The joint company has set the sales target for them at Y700 million for the initial year and Y1,300 million for five years hence.

Shikonin Efficiently Extracted From Hairy Plant Roots: Lion

Lion Corp. has developed technology for extracting useful substances from hairy plant roots. The company applied the new technology to gromwell, thereby obtaining about 1,000 times more shikonin than in the case of conventional extraction from natural gromwell; the comparison was made between hairy roots cultured for one month and natural gromwell grown for four years.

The technology is based on the phenomenon that a large number of hairy roots sprout from a plant at a point affected by Agrobacterium rhizogenes and produce the same secondary metabolite as that produced by their mother plant. They grow extremely rapidly when cultured by means of plant hormone-free culture media. They weigh about 60-200 times — 1000-2000 times in the case of some plant varieties and culture conditions — their original weight after being cultured for one month.

In the Lion Process, hairy roots are cultured within an air lift-type jar fermenter and shikonin (pigment) is absorbed into culture media, which are transferred to a high-polymer adsorbent-packed column designed to absorb the shikonin. The culture

(Contd. on p. 105)

Environment

DIOXIN RISK MAY BE LOWER, EPA STUDY SUGGESTS

A draft Environmental Protection Agency (EPA) staff paper suggests that previous estimates of the cancer-causing potential of dioxin are far too high. However, some scientists who have reviewed the document do not agree with the EPA assessment. The agency argues for reduction of the cancer-causing threshold by a factor of 16, says Peter Preuss, chairman of EPA's work group on dioxin. Preuss says the paper advocates that the previous estimate of daily exposure to dioxin that could result in a 1-in-1-million lifetime cancer risk be reduced—from 0.006 picogram/kg/-day to 0.1 picogram/kg/day. He acknowledges that so much scientific information is still lacking on dioxin's carcinogenic potential that "we reached our conclusion outside the boundaries of science". It is, he adds, "to a large degree a policy call rather than a science call". However, Preuss says, new scientific evidence includes genotoxicity assays suggesting dioxin does not harm the body's genetic structure. Preuss stresses that the agency has not officially changed any risk estimates and is still in the process of analysing peer review comments on the draft study.

EPA EASES REGULATION OF OIL AND GAS DRILLING WASTES

Following completion of a study of wastes from oil and gas production, the Environmental Protection Agency (EPA) says that it is not necessary to impose full-scale federal regulation on those wastes. Congress had exempted such wastes from regulation under the Resource Conservation and Recovery Act (RCRA) until the study was completed. J. Winston Porter, head of EPA's Office of Solid Waste and Emergency Response, says the wastes appear to be adequately regulated. Damage from those wastes, he adds, often occurs in violation of existing laws, underscoring the need for better enforcement. The oil and gas wastes are mostly water and drilling muds, containing a combination of chemicals used in oil well drilling. The toxic constituents include benzene, phenanthrene, lead, arsenic, barium, antimony and fluoride. EPA says pits and wells containing hazardous wastes should not pose a threat to human health if managed in compliance with current regulations.

STRICTER CONTROLS ON CYANAZINE PESTICIDE

Following a special review, the Environmental Protection Agency (EPA) has ordered tighter controls on the application procedures for the pesticide cyanazine, a Dow Chemical product, as a condition for its continued sale and use. EPA has determined that exposure to the pesticide causes birth defects and poses a significant threat to pregnant women who handle it.

The main risk is for people who mix, load or apply cyanazine; the dietary risk of exposure is not considered significant. EPA will require that the product carry labels that specify the use of protective gloves and aprons, and a closed loading system. The product, registered since 1971, is used mostly on corn.

DU PONT HAS A CFC SUBSTITUTE

Du Pont has received approval from the Food and Drug Administration (FDA) to market Formacel-S, a hydrogen-containing blowing agent to be used as a substitute for fully halogenated chlorofluorocarbon compound CFC-12. Formacel-S, the company says, will reduce depletion of the ozone layer by 95%, compared with that caused by CFC-12. CFCs are considered responsible for depletion of the atmospheric ozone layer, and CFC-12 is regarded as having the highest potential for ozone depletion of all CFCs now in use. Formacel-S has been used in other commercial applications, but FDA approval will enable its use in plastic forms, such as fast-food containers.

In further developments, Du Pont has joined Allied-Signal and 11 other companies in an effort to accelerate toxicity testing of alternatives to CFCs. Toxicologists from companies are pooling knowledge to develop and enhance toxicity testing for HCFC-123 and HCFC-134A, hydrogen-containing CFC compounds regarded as likely replacements for CFCs now used. The companies: Akzo, the Netherlands; ISC Chemical and Imperial Chemical Industries, England; Atochem, France; Hoechst and Kali-Chemie, West Germany; Montefluos, Italy; Asahi Glass, Daikin and Showa Denko, Japan; Racon, U.S.

ROHM IN RHINE DEAL

Rohm and Haas Frnace has signed a FF60m ($10.7m) four-year contract with the Rhin-Meuse water authority aimed at a substantial reduction in pollution from the R&H Lauterbourg plant in Alsace.

The plant produced 171,000 ton of chemicals last year, including fungicides, acrylic emulsions, PVC, oil additives and ion-exchange resins for water treatment. It is one of the major sources of organic pollution in the Rhine-Meuse Basin.

(Contd. from p. 104)
media continue to shuttle between the jar fermenter and the column. It has been confirmed that the hairy roots continue to produce shikonin for six months.

The new process helps considerably reduce production costs compared with a conventional tissue-culture method aimed at extracting the target product from callus.

The company has no plan for commercializing shikonin using the new process, taking into account the product's present market trend. It envisages applying the technology to several other plants in a bid to produce valuable plant ingredients used as pharmaceuticals, perfumery and pigments.

Unique Ceramic Fibre Stronger Than Carbon Fibre Developed

Shimadzu Corp. has developed a unique ceramic fibre which is stronger than carbon fibre and having higher heat resistance than glass fibre. Its thickness can be adjusted in the range between 7 and 20 microns and the price is likely to be below half that of carbon fibre.

This has resulted from success in developing a technique to increase the concentration of nitrogen necessary to elevate the fibre strength and also a technique for taking up molten fibre at high speed.

The new fibre is about 1.5 times stronger in tensile strength than carbon fibre and has a melting point of 1200°C, 200°C higher than that of glass fibre. There is still a problem, however, with its surface adhesive strength which is comparatively low, and the company is striving to improve this property.

It intends to cultivate a market for the product for use as cable conductors for the time being and will launch marketing activities on a full scale after removing the bottleneck.

Waste-plastics Disposal Technology Seen Being Put Into Practical Use

Fujitech Co. plants to complete within this year a commercial plant designed to regenerate waste plastics in the form of fuel oil using Mobil Chemical (US)'s ZSM-5 synthetic zeolite as catalyst. The company, together with Mobil Catalysts Corporation of Japan acting as a supplier of the synthetic zeolite, is now operating a semi-commercial plant at its Himeji factory. The related basic patent is owned by four groups including MITI's Agency of Industrial Science and Technology and The Research Development Corporation of Japan.

In the targeted process, waste polyolefin plastics — polyethylene, polypropylene and polybutylene, etc. — are pulverized, melted and fed into thermal decomposition equipment which heats the molten plastics up to 390-500°C and changes them into gaseous material: the material is as a follow-up step, fed into catalytic conversion equipment, which brings it into contact with the ZSM-5 at a temperature of 200-300°C and transforms it into low-molecular material (carbon number: below 22): the resultant product is additionally changed into low-boiling-point fuel oil after passing cooling equipment and is finally stored in a tank.

The fuel oil thereby obtained has a high degree of fluidity at low temperature, contains a large quantity of isomers and a small amount of olefin and is hardly coloured. It can be directly used as fuel oil.

Polyolefin plastics in both forms of homopolymer and copolymer can be treated in the said process. When the thermal decomposition equipment is combined with application technology, the process is capable of treating vinyl chloride resin, thus markedly expanding its application fields.

To date polyolefin plastics have hardly been recycled, though they have been partly reused as moulding material. The targeted process will facilitate disposal of difficult-to-treat waste plastics, spent agricultural use film/sheet and PET bottles in particular.

It has already been confirmed that spent ZSM-5 catalysts can be satisfactorily used in the process, thereby holding down waste-plastics treatment costs.

Thymus Retrovirus Said Different From T-cell Leukemia, AIDS Viruses

The Kitasato Institute has found that human thymus retrovirus (RNA tumor virus) is different from the human T-cell leukemia and AIDS viruses and there is a strong probability that the former is an endogenous virus.

The institute has obtained the finding by examining human T-cells affected by human thymus retrovirus and human thymic epithelial cells transformed by SV-40DNA. It has found the said retrovirus in the thymus of an abortive human embryo.

The finding is expected to help elucidate autoimmune diseases such as myasthenia, idiopathic ulcerative colitis and diffuse collagen disease. The institute envisages analyzing the properties of the retrovirus and its manifestation within cells, elucidating thymus disorders and searching for the cause of abnormal immunity.

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MARKET INFORMATION

Transport Strike Hits Chemical Market

The transport operators in Bombay had struck work completely paralysing the work in Bombay's Chemical Market. The incoming and offtake of goods from the market had come to a stand still. In the meantime, an acute shortage of oleum was reported affecting many downstream units based on oleum. Dyes intermediates were badly affected. Caustic Soda and Soda ash were in lime light in the beginning of the week. Titanium dioxide was steady. Methanol was in short supply. In view of high prices of nickel and its salts had gone up. Xylene was quoted at Rs. 15/-.

We cannot guarantee the accuracy of the prices published in CHEMICAL WEEKLY as they are based only on the enquiries made by our correspondent — and, as such they are not FIRM PRICES as between a buyer and a seller. The prices are published only with a view to giving some ideas of market conditions

The prices are inclusive of Excise and Maharashtra Sales Tax

The local sales of dyes was not upto the mark. However exports were better, particularly in the dyes intermediates.

(Prices as on 23rd March 1988)

INDUSTRIAL CHEMICALS	Per kg.
Ammonium sulphate	2.00
Ammonium phosphate (Mono)	14.50
Ammonium phosphate (Di)	12.00
Ammonium carbonate (DI)	17.00
Ammonium bicarbonate	4.75
Ammonium chloride	3.00
Ammonium nitrate	3.50
Arsenic white powder	21.00
Acrylamide (Resale)	59.00
Barium carbonate	6.00
Bleaching powder (33% Cl)	3.80
Borax (Granular)	15.00
Borax (Powder)	15.50
Boric acid (Tech.)	21.00
Bisphenol-A	47+ST
Butyl carbitol	35.00
Caustic soda (Flakes)	8.00
Caustic soda (Solid)	7.60
Caustic soda (Lye)	6.00
Calcium chloride 70% (solid)	3.25
Calcium chloride 75-80% (fused)	3.50
Calcium chloride 36% (Anhydrous)	5.00
Calcium Carbonate PPT	3.00
Calcium carbonate (Activated)	3.55
Camphor (Indian)	82.00
Cresylic acid	50.00
Cream of Tartar (Tech.)	64.00
Citric acid (Belgium) (Resale)	46.00
Citric acid (Indian) (Resale)	44.50
Copper sulphate	17.50
Chromic acid	50.00
Cyanuric chloride	120.00
Cobalt oxide	280.00
Carbitol	51+ST
Dicalcium phosphate (Anhydrous)	16.00
Ferric chloride (Lumps)	6.50
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Glue sheets	6.75
Gohsenol GH-17	80+ST

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Litharge	15.00
Lead Acetate (Tech.)	28.50
Lithopone	15+ST
Magnesium chloride (crystal)	2.00
Menthol crystal (Flakes)	185+Ex.+ST
Menthol bold	205+Ex.+ST
Menthol crystal bold	245+Ex.+ST
Magnesium carbonate (Japan)	16.00
Magnesium carbonate (Indian)	15.00
Maleic Anhydride (per kg)	38+ST
Mercury (75 lbs.)	9,000.00
Nickel chloride	90.00
Oxalic acid (Resale)	20.00
Peppermint oil (Rectified)	90+Ex.+ST
Potassium carbonate (Indian)	19.00
Potassium carbonate (Imported)	21.00
Potassium bichromate	22.00
Potassium phosphate (Mono)	14.00
Potassium phosphate (DI)	14.00
Polyvinyl alcohol (No. 117)	88.00
Polyvinyl alcohol (No. 173) (Resale)	92.00
Polyvinyl alcohol (No. 208)	78.50+ST
Paraformaldehyde (Resale)	18.00
Phthalic anhydride 96%	23.25
Pentaerythritol (Resale)	51.50
Paraffin wax (Resale)	14.50
Rangolite (German)	70.00
Rangolite (Czech.)	46.00
Sodium sulphate (Fine)	4.00
Sodium sulphate (Coarse)	3.80
Sodium sulphide 50-52% (Flakes)	8.00
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Soda Ash (Birla)	3.80
Soda Ash (Imp.)	3.50
Sodium bicarbonate	5.25
Sodium bisulphite	4.50
Sodium silicate	3.00
Sodium acetate	6.00
Sodium alginate	120+ST
Titanium Dioxide (Anatase)	51+ST
Titanium Dioxide (Rutile — RCR_2)	70+ST
Tartaric acid (Crystal)	84.00
Trisodium phosphate	4.80
Thiourea	70+ST
Urea (Tech)	2.75
Vacuum salt	1.00
Zinc Dust	30.00
Zinc Oxide	30.00
Zinc chloride powder (technical)	14.00
Zinc sulphate	4.00

SOLVENTS		Per kg.
Acetic Acid (Glacial)	(Resale)	14.50
Acetic Anhydride	(Resale)	30.00
Acetone	(Resale)	17.00
Adipic Acid		51+ST
Aceto Acetanilide		50.00
Aniline Oil	(Resale)	42.00
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Butyl acrylate		115+ST
Butanol	(Resale)	35.00
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Benzoyl chloride		22.00
Benzyl alcohol (FPC)		36.00
Bromine Liquid		42.50
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Carbon Tetrachloride		10.75
Cellosolve		47.00
Cyclohexanone		44+ST
Cyclohexanol		43.00
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1-Phenyl 3-methyl-5 Pyrazolone	**120.00**
Phenyl J. Acid	**340.00**
Para Amino Benzoic Acid	**170.00**
PT Base	**88.00**
Rhoduline Acid	500.00
Resist Salt	**20.00**
Resorcinol	**140.00**
Sodium Naphthlonate	63.00
5-Sulpho-Anthranilic Acid	**60.00**
Sulphanilic Acid	27.00
Sulpho Tobias Acid	**100.00**
Trichloro Benzene (TCB)	15.00
Tobias Acid	115.00

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3,4,5 TRIMETHOXY BENZALDEHYDE
ETHYLENE CHLOROHYDRIN
CALCIUM CARBONATE
METHYL ETHYL KETOXIME
DIBUTYL TIN OXIDE
ALLYL CHLORIDE
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Mehsana Mansion No. 2, Block 3,
Tejpal Road, Vile Parle (East), BOMBAY-400 057.
Telephone : 6140800

Bombay Dyes Market

(Prices as on 23rd March 1988)

ACID COLOUR	Per Kg
Acid Violet 4BS	143.00
Acid Maroon V	110.00
Acid Orange II	77.80
Acid Orange IIY	63.05
Acid Red A	107.25
Croselin Scarlet MOG	155.00
Acid Scarlet 3R	99.90
Acid Red 38N	135.00
Acid Red R2R	132.00
Acid Red RS	88.00
Acid Green V	230.00
Acid Patent Blue AS	250.00
Acid Coomasi Blue	200.00
Acid Yellow 5GN	65.00
Acid Red PG	85.00
Acid Red GRS	78.00
Acid Black 10 BX	121.95
Acid Black BX	98.40
Acid Black Wax	135.50
Procinil Yellow GS (ICI, UK)	265.00
Procinil Red GS (ICI, UK)	530.00
Procinil Blue RS (ICI, UK)	315.00
Procinil Scarlet G (ICI, UK)	600.00
Procinil Orange G (ICI, UK)	250.00
Procinil Rubine (ICI, UK)	550.00

DIRECT COLOURS	Per Kg.
Yellow 3GX	88.10
Gun Yellow RCH	124.00
Fast Yellow GCH	141.15
Yellow CFG Hly. Conc.	312.00
Fast Yellow GS	111.65
Fast Yellow CHRS	95.45
Viscose Orange	166.15
Fast Orange GR	133.75
Red	96.90
Dark Tan	78.25
Red IIR	72.55
Red 4B	169.10
Bordeaux BW	132.30
Fast Scarlet 4BS	166.55
Red 12B	170.55
Bordeaux Hly Conc.	194.00
Cotton Red N	117.05
Brill. Fast Helio B	278.00
Brill. Fast Helio 2B	297.00
Brill. Fast Helio 2RS	136.20
Brill. Fast Helio BS	116.10
Brill. Violet Extra	126.40
Blue 2B	86.40
Blue G	170.50
Sky Blue FB	188.25
Copper Blue GR	147.00
Fast Greenish Blue GL	114.60
Developed Black BT	116.10
Blue NB-2B	300.20
Blue NB-2BC	185.30
Developed Black NB-GHB	185.30
Green B	111.65
Green NB-B	188.25
Green 2B-N	188.25
Brown MR	154.40
Brown CN	107.25
Golden Brown G	140.35
Catechin G	120.50
Omega Tan	126.40
Catechin GS	102.80
Black E Hly Conc.	142.60
Black E Extra Hly Conc.	142.60
Black NB-ER Hly. Conc.	310.50

DISPERSOL COLOURS	Per Kg
Yellow 6G Powder	143.80
Red B 3B Powder	247.80
Red B 2B Powder	323.20
Red CB Powder	439.15
Red D2B Powder	477.40
Violet C 4R	521.90
Blue BG Powder	235.45
Blue BN Powder	103.75
Blue D 2R Powder	476.25
Navy BT Powder	243.90
Blue B 2G Powder	210.20
Black BT Powder	182.60
Blue BR Powder	390.20
Yellow 7GL	338.60
Yellow 5RX	218.80
Yellow 3G	367.25
Yellow	140.00
Yellow AL	135.30
Yellow Brown REL	247.50
Yellow FFL	463.60
Gold Yellow GG	259.70
Pink REL	247.00
Red REL	468.65
Red 2B	327.40
Red FB	324.20
Red Violet FBL	469.85
Orange 3R	196.65
Violet 3R	280.00
Violet RL	275.45
Violet 6R	485.75
Scarlet RR	214.85
Rubine 3B	223.05
Rubine CB	364.90
Blue GL	318.95
Blue BGF	636.55
Navy Blue RF	270.40
Brown 3REL	200.40
Black GEL	324.20
Dark Brown 3B	317.40

BASE COLOURS	Per Kg
Fast Yellow	80.20
Fast Orange GC	135.45
Fast Scarlet R	166.90
Fast Scarlet RC	126.65

Fast Scarlet RCR	99.05
Fast Scarlet G	121.65
Fast Scarlet GN	91.50
Fast Scarlet GG	72.70
Fast Scarlet GGS	72.75
Fast Red B	203.20
Fast Red RC	119.15
Fast Red R Flakes	149.25
Fast Red TR	166.80
Fast Red TR Oil	183.15
Fast Red RL	237.10
Fast Red KB Oil	201.90
Fast Bordeaux GP	201.95
Fast Garnet GBC	94.05
Fast Violet B	505.60
Fast Blue BB	521.45

NAPHTHOL COLOURS	Per Kg
ASG	217.00
AS	143.00
ASSW	279.75
ABBS	189.15
ASBO	195.65
ASD	175.50
ASOL	179.35
ASTR	279.75
ASPH	279.75
ASE	196.05
ASEI	184.40
ASLB	1632.60
ASBT	1817.00
ASWG	143.00
ASSG	397.70
ASSR	480.50

PROCION COLOURS	Per Kg
Golden Yellow HR	181.80
Brill. Yellow H4G	117.85
Supra Yellow H-8GP	168.55
Brill. Yellow HE6G	166.95
Yellow H-E4R	276.05
Brill. Yellow H7G	332.30
Yellow M4R	243.95
Yellow M GR	326.05
Brill. Yellow M4G	177.10
Brill. Yellow M8G	332.30
Yellow M 3R	217.60
Brill. Orange H 2R	241.85
Brill. Red H 7B	157.95
Brill. Orange M 2R	313.15
Brill. Red H 85	169.45
Brill. Scarlet H RN	245.05
Supra Red H-3BP	179.30
Brill. Red H-F3B	243.45
Brill. Magenta HB	167.00
Brill. Red M. 5B	98.90
Brill. Red M 8B	173.70
Brill. Pink MB	137.10
Brill. Magenta MB	121.55
Brill. Purple H-3R	180.20
Brill. Purple H-7R	176.40
Navy Blue H 3R	298.50
Brill. Blue H-GR	366.55
Brill. Blue H 5G	173.10
Blue H 5R	283.85
Brill. Blue H 7G	178.70
Brill. Blue H 7RX	358.15
Turquoise HA	234.45
Supra Blue H-3RP	335.70
Supra Turquoise H 2GF	181.50
Blue H 5RX	269.30
Navy Blue H ER	258.60
Blue H-ERD	305.80
Navy Blue M 3R	310.95
Brill. Blue MR	331.70
Brill. Blue M RX	214.20
Brill. Blue M-G	382.30
Blue M 4GD	344.60
Navy Blue M RB	318.75
Turquoise M-G	197.85
Brill. Blue M GX	302.50
Blue 3R Acra Powder	718.20
Dark Brown H 6R	248.45
Cobalt Oxide (per kg)	285.00
Green H 4BD	269.80
Green H-E4B	169.80
Red Brown H IF	143.25
Orange Brown H 28	209.05
Brown M GRN	188.60
Black H-N	283.35

SULFUR COLOURS	Per Kg
Navy Blue	99.85
Green G	105.55
Black Grains Extra	63.05
Black Grains OG	64.55
Black GXE Conc.	61.60
Black GXE	52.75
Black GXR	61.60
Black Grains 800	54.20
Black EXR Grains	64.55
Black EXR Grains 800	51.25

VAT COLOURS (ICI)	Per Kg
Yellow 5G Powder Fine	673.15
Yellow 5G Supra-Disperse	439.30
Yellow 5G Acra Conc.	628.75
Yellow 3R Powder	588.85
Gold Orange 3G Pdr. Fine	952.15
Brill. Orange 6R Pdr. Fine	624.35
Gold Orange 3G Supra Disp.	601.30
Brill. Orange 6RX Powder	394.30
Brill. Red 3B Pdr. Fine	997.80
Brill. Red 3B Supra Disp.	713.20
Brill. Purple 4R Conc. Pdr.	470.75
Brill. Purple 3R Acra Powder	690.85
Brill. Purple 2R Hly Conc.	597.90
Brill. Purple 4R Supra Disp.	500.05
Brill. Purple 2R Acra Conc.	625.95
Blue R Powder Fine	542.15
Blue BC Conc. Pdr. Fine	522.50
Blue BC Acra Conc. Pdr. Fine	762.70
Blue R Conc. Pdr. Fine	577.65
Blue RR Supra Powder	629.35
Blue Conc. Powder	645.80
Brill. Blue 2R Hly. Conc.	378.55
Brill. Blue 2R Supra Disp.	115.65
Dark Blue 2R Powder Fine	389.25
Blue BC Supra Disp.	359.40
Jade Green XBN Powder Fine	438.20
Jade Green XBN Acra Conc. Powder	823.90
Jade Green 2G Pdr. Fine	419.65
Jade Green 2G Ptg. Paste	125.40
Jade Green XBN Ptg Paste	126.00
Jade Green 2G Supra Disp.	496.00
Olive Green B Pdr. Fine	399.90
Olive D Pdr. Fine	444.30
Olive Green B Supra Disp	308.25
Jade Green XBN Supra Disp. (N)	327.30
Olive OMW Pdr. Fine	698.55
Olive OMW Supra Disp.	538.05
Olive R. Pdr. Fine	422.95
Olive R. Pdr. Fine	422.95
Olive D Supra Disp.	361.70
Olive R supra Disp.	363.90
Olive D. Ptg. Paste	193.00
Olive Green B. Ptg. Paste	199.10
Olive Green B Acra Conc.	542.75
Olive R Acra Conc.	640.00
Olive Green B Acra Conc.	542.75
Brown R Pdr. Fine	835.00
Brown G. Pdr. Fine	795.00
Brown R Pdr. Fine	659.75
Dark Brown 3R Pdr. Fine	685.00
Brown G. Supra Disp.	449.90
Brown 2G Supra Disp.	554.00
Brown R Supra Disp.	422.95
Brown BR Powder	719.00
Dark Brown 3R Ptg. Paste	217.15
Dark Brown 3R Supra Disp.	414.55
Brown G Acra Conc.	733.95
Brown R Acra Conc.	766.00
Grey M. Powder Fine	768.80
Grey M. Supra Disp.	585.45
Blue BC Acra Conc. Pdr. Fine	762.70
Direct Black AC Supra Disp.	330.35
Direct Black AC Pdr. Fine	474.70
Direct Black CH Supra Disp.	393.20
Direct ACD Ptg. Paste	217.15

Bombay Drugs Markets

(Prices as on 23rd March 1988)

Product	Rs. per kg.
Acetazolamide IP	700.00
Acriflavine BPC	820.00
Aluminium Hydroxide IP	22.00
Ampicillin Trihydrate	2,000.00
Aspirin IP	68.00
Barium Sulphate	19.90
Belladona Extract	74.50
Benzoic Acid IP	31.40
Caffeine Citrate IP	305.00
Caffeine IP	725.00
Calcium Gluconate IP	35.00
Calcium Glycerophosphate	145.00
Calcium Hypophosphate BPC	120.00
Calcium Phenthonate	500.00
Calomel BP	330.00
Cetrimide IP	215.00
Chloroquine Phosphate	570.00
Choline Chloride FG	30.00
Choline Chloride IP	65.00
Citric Acid IP	50.00
CMC Sodium HV	85.00
C. P. Maleate IP	505.00
Dapsone IP	320.00
D. C. Citrate	315.00
Dexamethasone	75.00
Diastase (1:50)	58.00
Diazepam IP	600.00
Di Iodo Hydrin	420.00
Diloxanide Fumarate IP	380.00
Di Phenyl Hydrogen Citrate	215.00
Di Sodium Hydrogen Citrate	43.00
D-Panthenol Liquor	600.00
Ergomatrine Maleate	135.00
Ephedrine HCL	1500.00
Ethambutol IP	650.00
Ferrous Fumarate	43.00
Follic Acid IP	4500.00
Furosemide IP	1,210.00
Furazolidone IP	330.00
Gentamycin Sulphate	9.20
Gum Acacia	57.00
Gum Acacia White	95.00
Gum Guar	26.00
Hematropine Methyl Bromide	9.25
Ibuprofen IP	420.00
I.N.H.	210.00
Inosite IP	560.00
Iodochloro	340.00
Iodoform NF	540.00
Lactose IP	33.00
Lactic Acid	68.00
Lignocaine HCl	255.00
Lignocaine Base	255.00
L. Lycine Feed	135.00
L. Lycine Pharma	170.00
Magaldrate IP	51.00
Magnesium Carbonate IP	15.00
Magnesium Hydroxide	19.00
Magnesium Hypophosphate	125.00
Magnesium Trisilicate IP	10.50
Mannitol USP	58.00
Mebendazole	550.00
Mercurochrome NF	285.00
Menthol	190.00
Metronidazole IP	387.00
M. P. S.	142.00
Niacinamide	210.00
Oil Mentha	80.00
Oxyphenbutazone	525.00
Papaine BPC	51.00
Paracetamol	98.00
Pectine IP	233.00
Pepsin 1 :3000	340.00
Pheniramine Maleate	700.00
Phenyl Butazone USP	265.00
Potato Starch	65.00
Rifampicin IP	2,900.00
Saccharine Sodium	225.00
Salbutamol Sulfate	8.25
Sodium Hydrophosphate	125.00
Sodium Salicylate	70.00
Sorbitol USP	17.25
Sorbitol Powder	125.00
Sulfacetamide	268.00
Sulphamethoxazole	385.00
Tinidazole	350.00
Theophylline Anhy.	550.00
Trimethoprim IP	920.00
Vitamin A, Palmitate	3500.00
Vitamin B1 Hydrochloride	1,800.00
Vitamin B1 Mono nitrate	1,500.00
Vitamin B2	2400.00
Vitamin B6 Hydrochloride	1600.00
Vitamin B12	165.00
Vitamin B2 5-Phosphate	3700.00
Vitamin C. Plain	320.00
Vitamin C coated	329.00
Vitamin K_3 W/S	650.00
Yeast Powder	24.00

We cannot guarantee the accruacy of the prices published in CHEMICAL WEEKLY as they are based only on the enquiries made by our correspondent — and, as such, they are not FIRM PRICES as between a buyer and a seller. The prices are published only with a view to giving some idea of market conditions.

Delhi Market

DELHI : MARCH 25, (NNS) — A sharp fall of Rs. 300 in sodium nitrite provided the main feature of trading in the local chemicals market during last week, says NNS. Sodium nitrate also slipped by Rs. 15 on improvement in arrivals, whereas soda bicarb NAL hardened by Rs. 10.

Sodium nitrite suffered a sharp fall of Rs. 300 at Rs. 900/1000 per 50 kg. as demand by stockists fell. Sodium nitrate also declined by Rs. 15 at Rs. 430 due to increased offering.

Paraffin wax declined further by Rs. 5 at Rs. 575 per 50 kg. on poor offtake caused by improvement in supply day by day. Refined wax also being offered lower at Rs. 675. Menthol flake, medium and bold declined from Rs. 190, Rs. 188 and Rs. 200 to Rs. 188, Rs. 175 and Rs. 198 per kg. respectively on increased selling by stockists, Mentha oil was also traded lower at Rs. 140 against Rs.142. Menthol prices may fall further in expectation of brightened crop prospects this year in U.P. Sodium sulphate reacted downward by Rs. 2/3 at Rs. 155/158 for want of support by stockists.

Caustic soda flake appreciated by Rs. 5 on tight supply. Soda bicarb NAL also gained Rs. 10 at Rs. 280 owing to reduced arrivals and good offtake. Tartaric acid firmed up by Rs. 25 at Rs. 7125 per 50 kg. on improvement in demand. Chatkolight edged up by 50 paise at Rs. 49.50 on poor import from China along with brisk buying by gur khandsari makers. Hydrogen peroxide ruled static at Rs. 31/32. Ammonia bicarb firmed up by Rs. 2 at Rs. 122 on scarce supply and good demand from bakeries.

Dyes and colours remained quiet and hovered around at their previous level.

(DELHI MARKET RATES AS ON MARCH 25, 1988)

Ammonia Bicarb (per 25 kg)	122.00
Mercury (per flask)	9000.00
Soda ash (per bag)	255-290.00
Ammonium Chloride (per 50 kg.)	105-160.00
Caustic soda solid (per 50 kg)	410.00
Caustic soda flakes (per 50 kg)	395-400.00
Citric acid (per 50 kg)	2300-2600.00
Stable Bleaching Powder Shriram (per 25 kg)	95.00
Stable Bleaching Powder KCI (per 25 kg)	85.00
Stable Bleaching Powder MODI (per 25 kg)	93.00
Sod. Bicarbonate (per 50 kg)	255-280.00
Sod. Hydro Sulphite (per kg)	34-36.00
Rangolite (per kg)	49.50-80.00
Boric acid Technical (per 50 kg)	975-985.00
Paraffin wax (per 50 kg)	575.00
Taratric acid (per 50 kg)	7,100.00
Borax Granular (per 50 kg)	570.00
Borax Crystal (per 50 kg)	580.00
Sodium Nitrate (per 50 kg)	445.00
Sodium Nitrite (per 50 kg)	1,000.00
Camphor Powder (per kg.)	93.00
Camphor Thal (per kg)	99.00
Menthol Medium (per kg)	188.00
Menthol Flake (per kg)	175.00
Menthol Bold (per kg)	198.00
Glycerine (per kg)	43-45
Sodium Silicate (per quintal)	200-250.00
Hexamine (per kg)	48.00
Acetic Acid Glacial (per kg)	14.50-18.00
Copper Sulphate (per quintal)	1800-2100.00
Formic acid (per kg)	30.00
Formaldehyde (per kg)	6.00
Hydrogen Peroxide (per kg)	31-32.00
Calcium Carbonate (per tonne)	2500-4000.00
Acid Slurry Soft (per kg)	23.00
Acid Slurry Hard (per kg)	30.00
Phosphoric Acid (per 50 kg)	825.00
Pot. Nitrate (per quintal)	900-1200.00
Pot. Permanganate (per 50 kg)	2300.00
Sod. Bichromate (per 50 kg)	1025-1125.00
Tri-Sod. Phosphate (per 50 kg)	340-350.00
Titanium Dioxide Anatase (per kg)	51.00
Titanium RC-822 (per kg)	67.00
Zinc Oxide (per mt)	34000-38000.00
Phenol Carbolic Acid (per kg)	42.00
Carbon Tetrachloride (per kg)	16.50
Chloroform (per kg)	26.00
Sodium Sulphate (per 50 kg)	155-158.00
Naphthalene Balls (per 50 kg)	1400.00

DYES & COLOUR	per kg
Naphthol AS	150.00
Naphthol ASG	235.00
Naphthol ASBS	200.00
Naphthol ASTR	302.00
Naphthol ASOL	191.00
Naphthol ASBO	208.00

DIRECT DYES	(per kg)
Black E. Conc	92-155.00
Diazo Black B T.	125.00
Green B	119.00
Blue 2-B	88.00
Sky Blue FB	200.18
Basic Auramine O' Conc.	65-110.00
Basic Rohdamine B.500%	220-320.00
Basic Methylene Blue	92-130.00
Basic Violet	142-160.00
Basic Malachite Green	180-185.00
Acid Orange	45-52.00

Madras Market

Condition in the Chemical market during the week were steady. Supply position of caustic soda is getting increasingly difficult due to power cut in the majority of southern states. Hydrogen Peroxide and Diethylene Glycol prices were up due to scarce supplies and it is reported heavy shipments of Hydrogen peroxide were expected during first week of April 1988.

(MADRAS MARKET RATES AS ON MARCH 26, 1988)

Acetic Acid — Glacial (per kg.)	16.00
Acid Slurry (Soft) (per kg)	26.00
Aluminium Sulphate Iron free (per tonne)	1800.00
Ammonium Bi-carbonate (per 25 kg.)	125.00
Ammonium Chloride SPIC (per tonne)	1800.00
Bleaching Powder — Mettur (per 25 Kgs. bags)	100.00
Borax Granular	640.00
Cresylic Acid 100% (per kg.)	85.00
Meta Cresol 40/42% (per kg.)	47.00
Para Cresol 80%/85% (per kg.)	55.00
Caustic Soda Flakes (Mettur) (per ton)	8200.00
Caustic Soda Flakes (Andhra sugar)	8200.00
Citric Acid — Indian (per kg.)	42.00
Copper Sulphate (per 50 kg.)	1000.00
Formic Acid (India) (per kg.)	27.00
Formaldehyde (per kg.)	7.00
Glycerine (per kg.)	40.00
Hydrosulphite of Soda TCPL (per kg.)	32.00
Hydrosulphite of Soda IDI (per kg.)	36.00
Hydrosulphite of Soda BASF (per kg.)	38.00
Hydrogen Peroxide (India) (per kg.)	35.00
Hyflo Supercel	19.00
Magnesium Carbonate Light	18.00
Potassium Bichromate (per kg.)	26.00
Phosphoric Acid (per kg.)	18.00
Phthalic Anhydride (per kg.)	28.00
Pentaerythritol (per kg)	52.00
Paraffin Wax (per kg.)	13.50
Oxalic Acid (per kg.)	20.00
Soda Ash (TAC) (per 75 kg.)	325.00
Soda Ash (TATA) (per 75 kg.)	330.00
Sodium Cyanide Indian (per kg.)	47.00
Sodium Cyanide Degussa (per kg.)	70.00
Sodium Bichromate (per kg)	19.00
Sodium Bicarbonate (per 50 kg.)	280.00
Sodium Nitrite (per 50 kg.)	630.00
Sodium Nitrate (per 50 kg.)	420.00
Sodium Silicate (per tonne)	4000.00
Sodium Sulphate (per tonne)	3500.00
Sodium Sulphide Flakes (per tonne)	13,000.00
Sodium Bi-sulphite (per 50 kg.)	185.00
Stearic Acid (per kg.)	30.00
Trisodium phosphate (per 50 kg.)	330.00
Titanium Di-oxide Indian TTP (per kg.)	48.00
Titanium Di-oxide Indian Rutile (per kg)	58.00
Urea Tech (per tonne)	2800.00
Zinc Oxide (per kg.)	34.00
Zinc Chloride Powder (per kg.)	13.00
Zinc Sulphate (per tonne)	4500.00
Di-octyl phthalate (per kg.)	47.00
Di-butyl phthalate (per kg.)	47.00

SOLVENTS

Acetone (H.O.C.) (per kg.)	19.00
Isopropyl Alcohol NOCIL (per kg.)	27.50
Diacetone Alcohol NOCIL (per kg.)	28.50
Benzene SAIL (per kg.)	15.00
Diethylene Glycol NOCIL (per kg.)	36.00
MIBK NOCIL (per kg)	35.00
Butanol NOCIL (per kg.)	33.50
Toluene SAIL (per litre)	14.00
Xylene IPCL (per litre)	14.00
Phenol HOC (per kg.)	28.00
Turpentine (per litre)	13.50
Sorbitol (per kg.)	30.00
Trichloroethylene MCIC (per kg.)	23.50
Carbon Tetra Chloride (per kg.)	13.00
Chlorofrom (per kg.)	24.00
Methylene chloride (per kg.)	21.00
Methyl Ethyl Ketone (per kg.)	48.00
Cellosolve (per kg.)	50.00
Triethanolamine (per kg.)	23.00
Ethyl Acetate (per kg.)	22.00
Butyl Acetate (per kg.)	40.00

Materials Imported

BOMBAY
(From 18.12.87 to 22.12.87)

ACETIC ANHYDRIDE MIN. 98% : From F.R.G. : Triochem Products Ltd., 30,400 kgs., Rs. 3,05,878 ; 30,400 kgs., Rs. 3,05,878.

ACRYLIC ACID : From Taiwan : Tinna Enterprises P. Ltd., 5 M.T., Rs. 1,02,607.

ACRYLAMIDE : From Japan: Alok Synthetics P. Ltd., 1,000 kgs., Rs. 19,859 ; Sap Chemical Industries P. Ltd., 1,000 kgs., Rs. 19,859 ; Sanghi Textile Processors P. Ltd., 1,000 kgs., Rs. 19,859 ; Jayshri Silk Proc. Mills, 1,000 kgs., Rs. 19,859 ; Gopi Synthetics P. Ltd., 1,000 kgs., Rs. 19,859 ; Omikar Textile Mills P. Ltd., 1,000 kgs., Rs. 19,859 ; From Italy : Allana Sons P. Ltd., 1,000 kgs., Rs. 19,859.

ACTIVATED CARBON: From Japan : Gas Authority of India Ltd., 6,500 kgs., Rs. 2,54,901.

D-ALPHA PHENYL GLYCINE CHLORIDE HYDROCHLORIDE : From Spain : Alembic Chemical Works Ltd., 1,015 kgs., Rs. 3,12,031.

AROMATIC CHEMICALS : From U.S.A. : Industrial Perfumers Ltd., 14,152 kgs., Rs. 10,49,219.

AUXILIARIES : From Canada : Beta Naphthol P. Ltd., 178 kgs., Rs. 46,065.

BENZOYL CHLORIDE: From Japan : Indian Petrochemicals Ltd., 1,920 kgs., Rs. 43,131 ; From Belgium: Wockhardt Ltd., 18 M.T., Rs. 1,90,861.

BETA PICOLINE 98% PURITY : From U.S.A. : Lupin Laboratories Ltd., 1,900 kgs., Rs. 60,999.

BIS HYDROXY ETHYL ETHER OF BUTENE DIOL : Research Centre, 3,250 kgs., Rs. 2,61,131.

BISPHENOL A : From Australia : Asian Paints India Ltd., 8,000 kgs., Rs. 1,48,278 ; From Japan : Jindal Strips Ltd., 8 M.T., Rs. 1,48,278 ; From U.S.A.: Ingersoll Rand (India) Ltd., 17,000 kgs., Rs. 3,07,215 ; From Japan : Sarvodaya Resin Works, 16,000 kgs., Rs. 3,07,148.

BUTANOL : From Brazil : Sentinal Windows and Structural, 32 M.T., Rs. 3,49,514 ; From F.R.G. : Hico Products Ltd., 32 M.T., Rs. 3,49,514.

2 BUTENE 1, 4, DIOL (BUTENE DIOL) : From U.S.A. : Excel Industries Ltd., 32,749 kgs., Rs. 18,60,064.

BUTYL ACRYLATE : From F.R.G. : Colour Chem Ltd., 14,040 kgs., Rs. 19,234.

BUTYL PHENOL : From U.K. : Herbert Sons Ltd., 13.5 M.T., Rs. 2,30,560.

CAPROLACTAM : From Japan : Ajay Dye Chem Industries, 153 M.T., Rs. 38,28,368.

CAPTAN TECH 92% MIN. PURITY : From Japan : Shrem Capacitors Ltd., 28,000 kgs., Rs. 9,99,026.

CARBON : From Japan : C. Cantt & Co., 10,000 kgs., Rs. 2,08,747.

CARBON BLACK : From F.R.G. : Coates of India Ltd., 2,000 kgs., Rs. 63,018.

CARBON BLACK : From Netherlands : Asian Paints India Ltd., 1,200 kgs., Rs. 1,88,581.

CETYL PALMITATE : From F.R.G. : Bayer (India) Ltd., 300 kgs., Rs. 10,587.

CHLORO ACETYL CHLORIDE : From Japan : Jal P. Ltd., 3,640 kgs., Rs. 90,675.

CITRIC ACID MONOHYDRATE BP 80 : From F.R.G. : KRIBHCO, 6.125 M.T., Rs.

COUMARIN : From France : Rallis India Ltd., 250 kgs., Rs. 48,654.

CRESYLIC ACID : From F.R.G. : Dr. Beck & Co. Ltd., 50,000 kgs., Rs. 7,67,871.

CYANURIC CHLORIDE : From France : Hico Products Ltd., 250 kgs., Rs. 10,831 ; From Japan : Vinayak Chemical Industries, 500 kgs., Rs. 21,662; Atlantic Colour Industries, 500 kgs., Rs. 21,662 ; Mohita Dyechem P. Ltd., 500 kgs., Rs. 21,662 ; From Italy : Bharat Leather Corporation Ltd., 250 kgs., Rs. 10,831.

CYCLOHEXANE 99% : From F.R.G. : Ipca Laboratories Ltd., 3,200 kgs., Rs. 52,935.

CYCLOHEXANONE : From Yugoslavia : Tata Press Ltd., 6,840 kgs., Rs. 87,839.

CYCLOPENTANE 95%: From F.R.G. : Ipca Laboratories Ltd., 44.5 kgs., Rs. 11,042.

DANE SALT : From Australia : Wellman (I) P. Ltd., 2,500 kgs., Rs. 5,72,593.

3, 4, DICHLORONITROBENZENE : From U.K. : Cummins Diesel Sales and Service, 6,000 kgs., Rs. 2,36,317.

DIETHYL ANILINE : From F.R.G. : Bharat Heavy Electricals Ltd., 380 kgs., Rs. 15,178 ; G. Amphray Laboratories, 13,878 kgs., Rs. 4,00,538.

DIETHYL CARBAMOYL CHLORIDE : From Malaysia : Satramdas & Co., 2,090 kgs., Rs. 1,55,579.

DIETHYL SULPHATE: From U.S.A. : Hindustan Petroleum Corporation Ltd., 10,120 kgs., Rs. 1,68,118.

2, 4 DIHYDROXYBENZOPHENONE : From China : Pragati Pharmaceuticals Ltd., 200 kgs., Rs. 69,637.

1-2 DIHYDRO 2 OXYQUINOXALINE : From Netherlands : Cyanamid India Ltd.,

DIMETHYL ETHANOLAMINE : From Netherlands : Oil and Natural Gas Commission, 1,980 kgs., Rs. 57,669.

DIMETHYL SULFOXIDE : From China : Tata Exports Ltd., 6,000 Lbs., Rs. 64,342.

DIOCTYL TIN OXIDE: From Belgium : Shail Rubber and Engs. Industries, 1,000 kgs., Rs. 1,11,077 ; From Japan : Gandhi Parekh Investment Corporation Ltd., 1,000 kgs., Rs. 1,11,077.

DIPHENYL OXIDE TECHNICAL : From U.S.A. : Rallis India Ltd., 5,171 kgs., Rs. 1,09,536.

DL METHIONINE 98% FEED GRADE : From Spain : Devichand & Co., 2,500 kgs., Rs. 97,639.

EPICHLOROHYDRINE: From Japan : Anand Organics P. Ltd., 3,120 kgs., Rs. 78,051.

ETHOXY METHYLENE MALONIC ACID ESTER : From U.S.A. : American Embassy : 4,000 kgs., Rs. 6,19,592.

ETHYL CELLULOSE : From U.K. : Bharat Heavy Electricals Ltd., 1,134 kgs., Rs. 1,53,886.

ETHYL HYDROXY ETHYL CELLULOSE HIGH VISCOSITY : From U.S.A.: Sudarshan Chemical Industries, 498.96 kgs., Rs. 90,219.

ETHYL MERCAPTAN: From F.R.G. : M.P. Oils and Fats P. Ltd., 12,480 kgs., Rs. 2,39,575 ; From Japan : Vivek Electronic Corporation, 19,050 kgs., Rs. 3,91,311 ; From Japan : Resins & Plastics Ltd., 12,480 kgs., Rs. 2,50,315.

ETHYL VANILLIN : From Netherlands : Raptakos Brett & Co. Ltd., 500 kgs., Rs. 1,45,962 ; From Japan : New Sarnath Engg. Works, 500 kgs., Rs. 1,39,474 ; From Australia : N.K. Spinning Mills, 150 kgs., Rs.

ETHYLENE ACRYLIC ACID: From Netherlands : Cynamid India Ltd., 800 kgs., Rs. 22,242.

ETHYLENE GLYCOL MONO ETHYL ETHER : From Japan : American Embassy, 15,228 kgs., Rs. 2,08,941 ; From Morocco : Steel Cast Bhavnagar P. Ltd., 7.6 M.T., Rs. 94,077.

FERRIC AMMONIUM EDTA 50% SOLUTION : From U.K. : Agfa Gevaert India Ltd., 3,000 kgs., Rs. 87,751.

FORMAMIDE : From U.K. : Prakash Book Depot, 17,940 kgs., Rs. 3,60,361 ; From Japan: Asma Iron & Steel Industries, 5.06 M.T., Rs. 1,05,626.

FORMIC ACID : From U.K. : Chowgule & Co. P. Ltd., 5,040 kgs., Rs. 37,299 ; From Japan : Gujarat Plastic Industries, 5,040 kgs., Rs. 37,299.

FORMIC ACID 85% : From France : Hindustan Lever Ltd., 5,040 kgs., Rs. 37,299 ; From U.S.A. : O.N.G.C., 5,040 kgs., Rs. 37,299 ; From Australia : Mahavir Stamping Industries, 5,040 kgs., Rs. 37,299.

FURFURYLAMINE : From China : Ballarpur Industries Ltd., 1,980 kgs., Rs. 1,46,796.

GAMMA PICOLINE : From Belgium : Zenith Ltd., 10,070 kgs., Rs. 3,79,957.

GLYCERINE CRUDE : From Thailand : Matraco (India) Ltd., 98.106 M.T., Rs. 9,34,432.

GLYCERINE CRUDE (80% SOAP LYE) : From Thailand : Hasmukhlal Damji & Co., 97,723 kgs., Rs. 9,35,409.

GLYOXAL 40%: From FRG: Fouress (I) P. Ltd., 8,000 kgs., Rs. 88,967; From Japan: Nikeon Corporation, 8000 kgs., Rs. 88,967.

GUM ROSIN : From Japan : Fatechand Chaturpujwas, 17.5 M.T., Rs. 1,09,474; From U.K. : East India Hotel Ltd., 17.5 M.T., Rs. 1,09,474; Crompton Greaves Hong Kong; Hindustan Chemicals, 19.575 M.T., Rs. 1,26,986; From F.R.G. : Arushkumar & Co., 18 M.T., Rs. 1,16,769; From China : Prabhat Gen. Terpene Industries P. Ltd., 36 M.T., Rs. 2,33,538; From Japan : Uttam Calva Steels Ltd., 49.95 M.T., Rs. 3,19,435.

GUM ROSIN N. Grade : From U.S.A. : Cummins Diesel Sales & Services, 17,100 kgs., Rs. 1,07,536.

GUM ROSIN WW GRADE : From U.K. : Kemico Sales, 18,000 kgs., Rs. 1,22,727; From Japan : The National Newsprint and Paper, 99.82 M.T., Rs. 6,67,374; From Hong Kong : Hindustan Chemicals 20.25 M.T., Rs. 1,31,366; From F.R.G. : Ravi Chem Dye, 52,500 kgs., Rs. 3,40,577.

G. SALT : From U.S.A. : The Standard Batteries Ltd., 1,000 kgs., Rs. 1,24,105.

HEXACHLORO CYCLO PENTADIENE : From Japan : Eicher Good Earth Ltd., 100 M.T., Rs. 23,63,663.

HEXANE DIOL : From U.K.: Nitin Castings Ltd., 10 M.T., Rs. 5,40,379.

HYDRAZINE HYDRATE 80%: From France : Hindustan Ferodo Ltd., 8,800 kgs., Rs. 2,31,844.

HYDROGEN PEROXIDE 50%: From Spain : Bhagat Bros., 4.2 M.T., Rs. 37,088; From USSR. : Vijay Plastic Industries, 4.2 M.T., Rs. 37,088; From U.S.A. : Poonam Plastic Industries, 4.2 M.T., Rs. 37,088.

HYDRO SULFITE CONC. : From Australia : Rollatainers Ltd., 5,000 kgs., Rs. 54,612; From Pakistan : Kanhaiya Lal Gauri Shankar, 5,000 kgs., Rs. 54,612.

HYDROXY ETHYL CELLULOSE : From U.S.A. : SAIL, 1,000 kgs., Rs. 58,253.

IODINE CRUDE : From Japan : Imperial Rubber Products

Netherlands : Bharat Pulverising Mills P. Ltd., 1,000 kgs., Rs. 2,40,953; From Japan : Santosh Pharmaceuticals, 1,000 kgs., Rs. 2,33,671; From F.R.G. : JBA Printing Inks Ltd., 500 kgs., Rs. 1,191.

IODINE CRUDE 99.5%: From Japan : IDI Ltd., 1.52 M.T., Rs. 3,72,275.

IRGANON : From F.R.G. : N.O.C.I.L., 3 M.T., Rs. 5,03,874.

ISO-BUTANOL: From F.R.G.: Unipol Plastic Industries Ltd., 62.4 M.T., Rs. 5,35,778.

ISO-OCTANE : From F.R.G.: Ipca Laboratories Ltd., 411 kgs., Rs. 21,368.

ISO OCTANE 95% : From F.R.G. : Ipca Laboratories Ltd., 411 kgs., Rs. 16,512.

L-AMINO DIOL : From F.R.-G : Bawa Skin Co., 1,000 kgs., Rs. 5,71,005.

LACTOSE : From Australia : Yatin Steel, 6,000 kgs., Rs. 70,218.

LACTOSE BP/USP/IP : From U.S.A. : The Simplex Mills Co Ltd., 19,000 kgs., Rs. 2,25,674; From F.R.G. : Bajaj Auto Ltd., 18,000 kgs., Rs. 2,18,827.

LINEAR ALKYL BENZENE: From Korea : Continental Device India Ltd., 150 kgs., Rs. 17,20,813; From Sweden : Sonal Plastrum Industries P. Ltd., 100 kgs., Rs. 11,47,209.

MAGNESIUM OXIDE GRAIN: From Japan : Poritts & Spencer (Asia) Ltd., 9,900 kgs., Rs. 2,36,586.

MAGNESIUM OXIDE LIGHT : From F.R.G. : Elpro International Ltd., 4,950 kgs., Rs. 1,36,473.

MAGNESIUM OXIDE LIGHT (MIN. PURITY 96% WHITE): From Japan : Bharat Forge Ltd., 8,505 kgs., Rs. 63,055; From U.S.A. : Sun Export Corporation, 8,490 kgs., Rs. 62,944.

MALEIC ANHYDRIDE: From Japan : Golden Coating Corporation, 17.5 M.T. Rs. 2,31,686.

META TOLUENE DIAMINE CRUDE : From Japan : Continental Construction Co. Ltd., 1,000 kgs., Rs. 34,203.

METHOXY ETHYL PHENOL : From U.S.A. : The Bombay Oil Industries P. Ltd., 500 kgs., Rs. 4,21,665.

METHYL CELLULOSE: From U.K. : G.L. Morison & Jones (Ind.) Ltd., 500 kgs., Rs. 49,140.

METHYL CYCLOHEXANE : From F.R.G. : Ipca Laboratories Ltd., 308 kgs., Rs. 7,764.

METHYL CYCLOPENTANE 95% : From F.R.G. : Ipca Laboratories Ltd., 44.5 kgs., Rs. 3,979.

METHYL METHACRYLATE MONOMER : From Japan : The Ruby Mills Ltd., 22.68 kgs., Rs. 3,639.

METHYL PARATHION TECH. 80% : From G.D.R. : PVS Industries Ltd., 2,860 kgs., Rs. 76,358.

METHYLENE CHLORIDE : From U.S.A. : Cawasji Behranji & Co. 0.41 M.T., Rs. 2,910; 410 kgs., Rs. 2,910.

MICROCRYSTALLINE WAX: From Netherlands : Selective Dyechem P. Ltd., 11.96 M.T., Rs. 1,42,506.

MONO CHLORO PENTAFLUORO ETHANE: From U.K.: Navin Fluorine Industries, 3,000 kgs., Rs. 1,61,849.

NAPHTHALENE CRUDE : From Japan: Golden Color Lab., 30 M.T., Rs. 1,90,643; From Australia : Indian Rare Earths Ltd., 52.64 M.T., Rs. 2,78,764; Atul Products Ltd., 105 M.T., Rs. 5,56,044; From France : Navbharat Enterprise, 138.06 M.T., Rs. 7,31,120.

NITROAMINO PHENOL : From U.S.A. : Nehru Science Centre, 300 M.T., Rs. 1,47,021.

N.N. DIETHYL ANILINE : From F.R.G. : Matchwell Engg. P. Ltd., 3,990 kgs., Rs. 23,044.

N. BUTANOL : From F.R.G. : PIL., 49.92 M.T., Rs. 5,35,328; From U.S.A. : Raj Prakash Chemicals Ltd., 13,120 kgs., Rs. 1,44,169.

N-DECANE 95% : From F.R.G. : Ipca Laboratories Ltd., 43.5 kgs., Rs. 2,124.

N-DODECANE 95% : From F.R.G. : Ipca Laboratories Ltd., 44.5 kgs., Rs. 4,610.

N-HEPTADECANE 95% : From F.R.G. : Ipca Laboratories Ltd., 46.5 kgs., Rs. 13,846.

N-HEPTANE : From F.R.G. : Ipca Laboratories Ltd., 685 kgs., Rs. 21,584.

N-HEPTANE 95% : From F.R.G. : Ipca Laboratories Ltd., 685 kgs., Rs. 13,490.

N - HEXADECANE 95% : From F.R.G. : Ipca Laboratories Ltd., 46.5 kgs., Rs. 13,846.

N-OCTADECANE 95%: From F.R.G. : Ipca Laboratories Ltd., 46.5 kgs., Rs. 12,857.

N-OCTANE 95% : From F.R.-G. : Ipca Laboratories Ltd., 42 kgs., Rs. 3,209.

N - PENTADECANE 95% : From F.R.G. : Ipca Laboratories Ltd., 46 kgs., Rs. 8,479.

N - PENTANE 95% : From F.R.G. : S.D. Fine Chem P. Ltd., 875 kgs., Rs. 23,435.

N - PENTANE 99% : From F.R.G. : Ipca Laboratories Ltd., 875 kgs., Rs. 39,977.

N-TRIDECANE 95% : From F.R.G. : Ipca Labs. Ltd., 45 kgs., Rs. 9,890.

N.UNDECANE 95% : From F.R.G. : Ipca Labs. Ltd., 44 kgs., Rs. 7,798.

ORTHO TOLUDINE : From U.K. ; Syn. Dyestuff Inds., 1800 kgs., Rs. 26,872.

PARA CRESOL : From U.K. : Kirloskar Cummins Ltd., 600 kgs., Rs. 30,489.

PARA CRESOL PURE GRADE : From U.K. : Ceevees Arochem, 2,000 kgs., Rs. 84,261.

PARATERTIARY BUTYL PHENOL : From U.K. : IBH P. Ltd., 2,500 kgs., Rs. 43,027.

PARA TERTIARY BUTYL PHENOL : From Japan : Southern Sea Foods P. Ltd., 2,000 kgs., Rs. 34,422; 3,000 kgs., Rs. 51,633.

PENTAERYTHRITOL : From Hong Kong: Peico Elect. & Electronics Ltd., 49 MT. Rs. 6,16,283. From FRG : Maize Products, 47 MT, Rs. 5,91,128; From Italy : Shyam Ahuja P. Ltd., 10,800 kgs., Rs. 64,430.

PHENOL USP : From China : Grover Overseas P. Ltd., 50,000 kgs., Rs. 6,28,861; From F.R.G. : Ravi Chem Dye, 15.6 M.T., Rs. 1,98,270; From Taiwan : Yogi Industries, 31,200 kgs., Rs. 3.96,540.

PHENOL MIN. 99% PURE : From France : Rallis India Ltd., 96,000 kgs., Rs. 12,70,959.

POTASSIUM SILICATE: From F.R.G.: Nufoam Industries, 19,420 kgs., Rs. 1,47,508.

PROPYLENE GLYCOL: From China : Hindustan Ciba Geigy Ltd., 17,200 kgs., Rs. 1,82,170.

PROPYLENE GLYCOL TECH. : From Hungary : Sandoz (I) Ltd., 34,400 kgs., Rs. 3,62,444.

PROPYLENE GLYCOL USP : From F.R.G. : Cipla Ltd., 17,200 kgs., Rs. 1,86,725.

PROPYLENE OXIDE : From F.R.G. : Ferro Alloys Corporation Ltd., 3,520 kgs., Rs. 1,26,023.

RESORCINOL : From Republic of Korea : Calcom Electronics P. Ltd., 5,000 kgs., Rs. 2,41,614.

SILICON ALUMINATE OF SODIUM : From Belgium : Medical Centre of Bombay, 5,000 kgs., Rs. 3,14,660.

STYRENE MONOMER: From F.R.G. : The National Newsprint and Paper, 17,600 kgs., Rs. 3,26,213; From Canada : Lakhami Rubber Udyog P. Ltd., 7,410 kgs., Rs. 1,36,559; From Australia : Keshavlal Talakchand, 14.82 M.T., Rs. 2,73,118; 14,820 kgs., Rs. 2,73,118.

TEREPHTHALIC ACID (PURE) : From U.K. : Reliance Inds. Ltd., 2,600 M.T., Rs. 1,94,90,094. 5,400 M.T., Rs. 4,22,17,650; From Sweden : Guj. Paper Mills Ltd., 200 M.T. Rs. 14,99,228; From Japan : Radha Silk Mills Ltd., 200 M.T., Rs. 14,99,228.

TERTIARY BUTYL ALCOHOL : From U.K. : Bharat Forge Ltd., 2,480 kgs., Rs. 55,676.

TERT. DODECYL MERCAPTAN : From U.S.A. : Citurgia Biochemicals Ltd., 12.87 M.T., Rs. 2,05,304.

TERTIARY DODECYL MERCAPTAN (TDM): From Netherlands : Suneel Textile Mills Ltd., 13.94 M.T., Rs. 2,22,503.

TETRAHYDROFURAN: From Japan : Cipla Ltd., 5096 kgs., Rs. 1,68,667; From F.R.G. : Searle India Ltd., 3822 kgs., Rs. 1,26,500.

THIONYL CHLORIDE : From Australia : Keshavlal Telakchand, 5,100 kgs., Rs. 52,627.

THIO UREA : From Japan : Bakelite Hylam Ltd., 16.484 M.T., Rs. 4,23,696.

THYMOL BP/USP : From France : Chemical Centre, 750 kgs., Rs. 72,940; 750 kgs., Rs. 72940.

TITANIUM DIOXIDE : From Belgium : Mukand Iron & Steel Works Ltd., 5,000 kgs., Rs. 1,22,463; From Korea : Dawood Corporation, 20,000 kgs., Rs. 5,69,283; From China : Umedica Laboratories P. Ltd., 10 M.T., Rs. 3,06,588; From Malaysia : S.T.C., 5,000 kgs., Rs. 1,22,463; From U.S.A. : Grindwell Norton Ltd., 30 M.T., Rs. 9,19,765; From Czechoslovakia : Rajankumar & Bros. (Impex) P. Ltd., 1,000 kgs., Rs. 2,63,992; From Australia : Shalimar Paints Ltd., 3,000 kgs., Rs. 7,91,976; From Netherlands: E. Merck (I) Ltd., 20,000 kgs., Rs. 5,16,327.

TOLUENE DI ISOCYANATE: From F.R.G. : Jai Electric Inds. P. Ltd., 240 kgs., Rs. 12,289; From Japan : Chinar Chemicals, 0.5 M.T., Rs. 14,563; Arofines, 20 M.T., Rs. 5,45,453.

TOLUENE DI ISOCYANATE: From U.S.A. : Narmada Cement Co. Ltd., 18,000 kgs., Rs. 5,12,355.

TRIACETIN : From U.S.A. : Hind Filters P. Ltd., 2,404 kgs., Rs. 61,490.

TRIETHYLENE GLYCOL : From Japan : IOC Ltd., 17,480 kgs., Rs. 2,32,703.

3,4,5, TRIMETHOXYBENZALDEHYDE : From U.K. : Heatray Engg., 500 kgs., Rs. 1,47,616.

TRIMETHYL BENZALDEHYDE : From Australia : Parakh Foods P. Ltd., 2,000 kgs., Rs. 5,35,392.

TRIMETHYL PHOSPHATE : From Netherlands : Pesticides India, 14,400 kgs., Rs. 4,04,165; From Japan : Polypharma P. Ltd., 95.36 M.T., Rs. 26,18,396.

VANILLIN : From Norway : Sunil Synchem Ltd., 4,000 kgs., Rs. 5,56,044.

VANILLIN PURE : From Hong Kong : Bambino Video P. Ltd., 3,000 kgs., Rs. 5,10,370; From Japan : Chandan Dyes & Chemical Industries, 250 kgs., Rs. 40,876.

2,4, XYLIDINE: From U.S.A.: Milan Tin Works, 4,000 kgs., Rs. 2,64,451.

DYES MATERIALS IMPORTED (From 18.12.87 to 22.12.87)

NEPTUNE BLUE BASE 634 : From Hong Kong : Malwa Cotton Spinning Mills Ltd., 200 kgs., Rs. 98,938.

OPTICAL WHITENING AGENT : From F.R.G. : New Plastomers India Ltd., 2,040 kgs., Rs. 6,42,783.

RESOLIN RED F. : From F.R.G. : Dyes Sales (India), 200 kgs., Rs. 87,437.

RHODAMINE 6 : From U.K. : Goodlass Nerolac Paints Ltd., 300 kgs., Rs. 1,36,190.

SULPHUR YELLOW BROWN SG : From China : J.P. Shah & Bros., 2,500 kgs., Rs. 59,576.

DRUGS MATERIALS IMPORTED BOMBAY
(From 18.12.87 to 22.12.87)

CALCIUM PANTOTHENATE USP XX : From Switzerland : Bombay Pharma Products, 500 kgs., Rs. 89,364.

PROPYLENE GLYCOL USP/IP : From U.S.A. : Pfizer Ltd., 16,770 kgs., Rs. 1,90,938.

SODIUM STARCH GLYCOLATE USP : From China : Astra IDL Ltd., 400 kgs., Rs. 24,890.

SULFA DIMETHOXINE : From Pakistan : Madhoram & Sons, 1,000 kgs., Rs. 4,61,310.

SULPHADIAZINE BP : From China : Get Pharmaceuticals Ltd., 1,000 kgs., Rs. 2,87,446.

THEOPHYLLINE MONOHYDRATE USP. : From U.S.S.R. : Seva Enterprises, 3,000 kgs., Rs. 2,49,356.

MATERIALS IMPORTED BOMBAY
(From 18.12.87 to 22.12.87)

ACRYLIC FIBRES : From F.R.G. : Thermax Ltd., 12,500 kgs., Rs. 3,37,909.

EMULSIFIABLE POLYETHYLENE WAX : From Japan : G.M. Knitting Industries, 2,000 kgs., Rs. 41,041.

ENGINEERING THERMOPLASTICS : From Australia : Hindustan Alloys Mfg. Co. Ltd., 5,000 kgs., Rs. 1,03,538.

EPOXY RESIN: From F.R.G.: Jayantilal Chandulal & Co., 600 kgs., Rs. 33,321.

ETHYLENE VINYL ACETATE : COPOLYMER: From U.K. : Siganporia Bros., 22,000 kgs., Rs. 3,11,650.

H.D.P.E. : From Japan : Grover Overseas P. Ltd., 30 M.T.. Rs. 3,68,709 ; From F.R.G. : Shah Polymers, 10 M.T., Rs. 1,31,730.

H.D.P.E. BLOW MOULDING POWER GRADE : From F.R.G. : Lubrizol India Ltd., 16 M.T., Rs. 1,99,963 ; From USA: N.D. Plastics, 16.173 M.T., Rs. 1,49,882 ; From Japan : Paros Electronics P. Ltd., 16.307 M.T., Rs. 1,51,124 ; From Australia : East India Hotels Ltd., 12.5 M.T., Rs. 96,342 ; From Czechoslovakia : Valia Implex P. Ltd., 37.5 M.T., Rs. 3,06,027 ; From China : Prasad Drugs P. Ltd., 12.5 M.T., Rs. 1,02,009 ; From Yugoslavia : Rite Print Pak, 12.5 M.T., Rs. 1,02,009 ; From Czechoslovakia: Kalpesh Plastic Industries, 12.5 M.T., Rs. 96,342.

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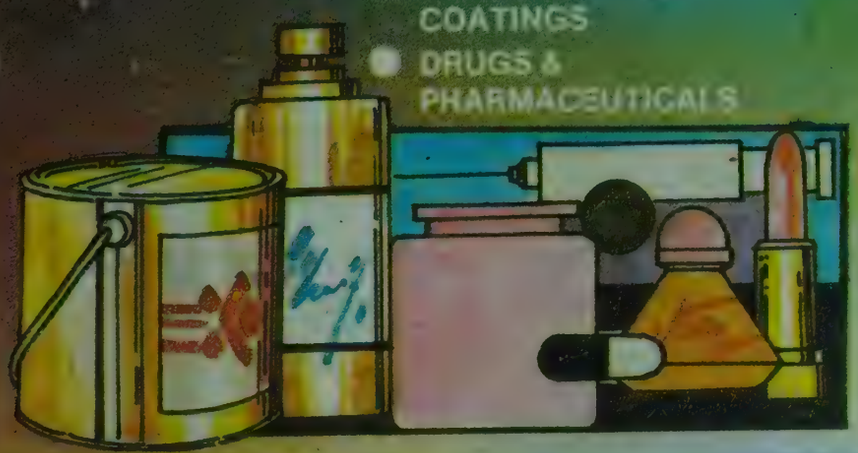
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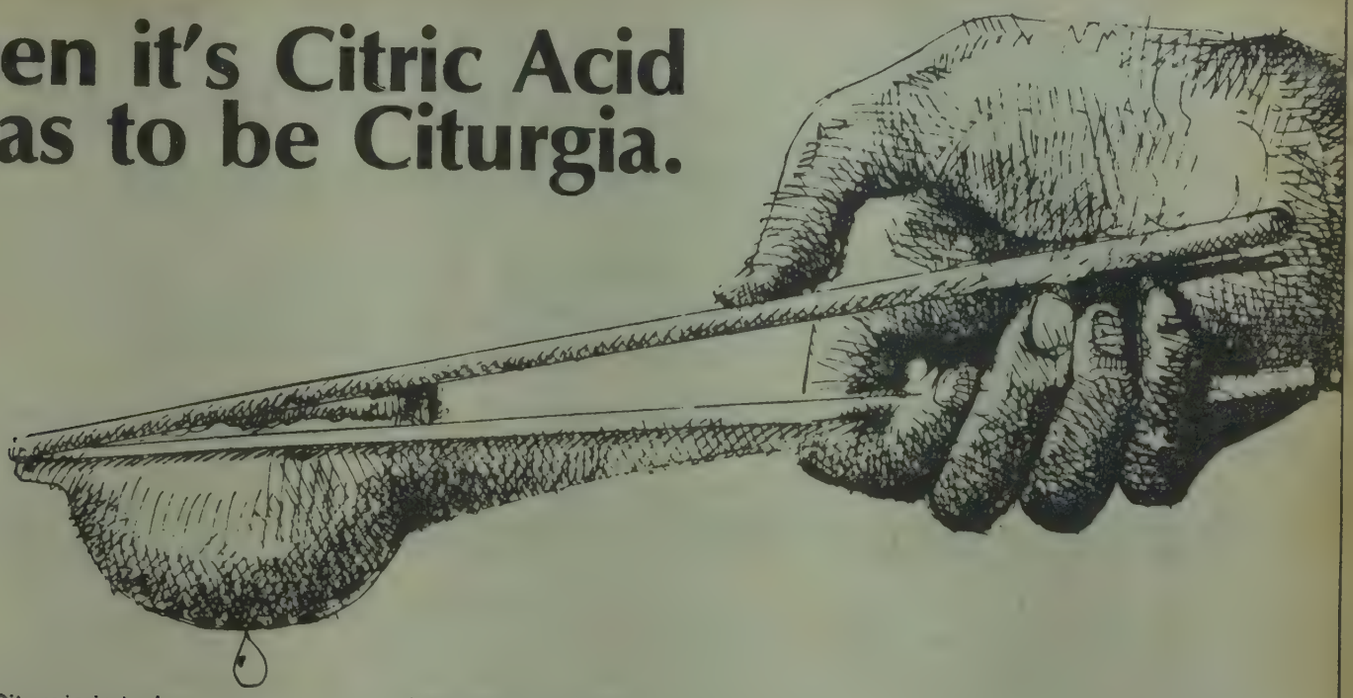
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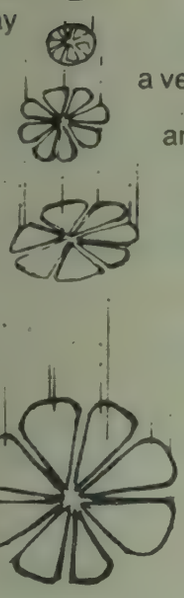
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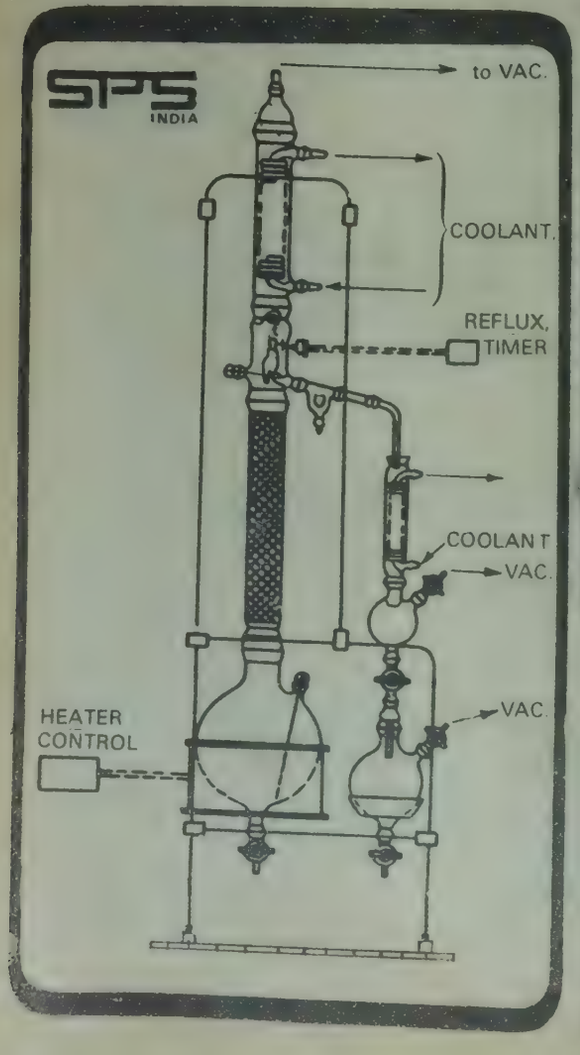
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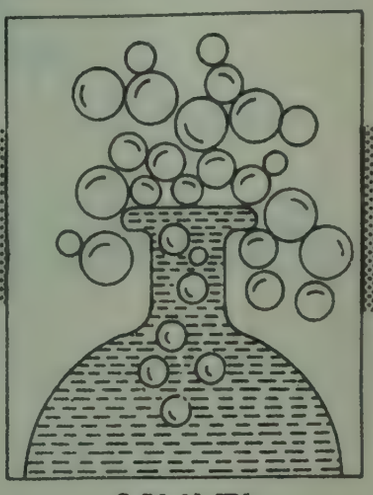


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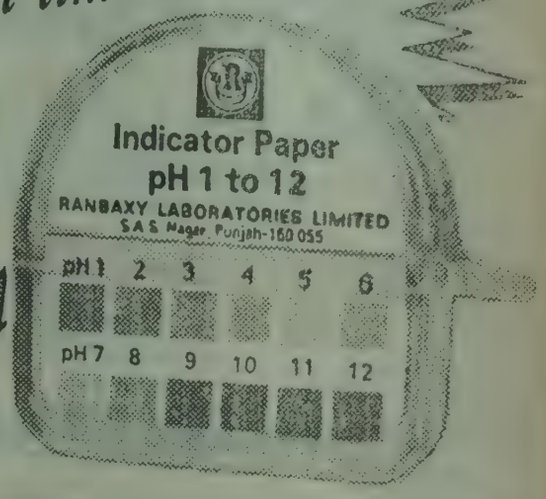
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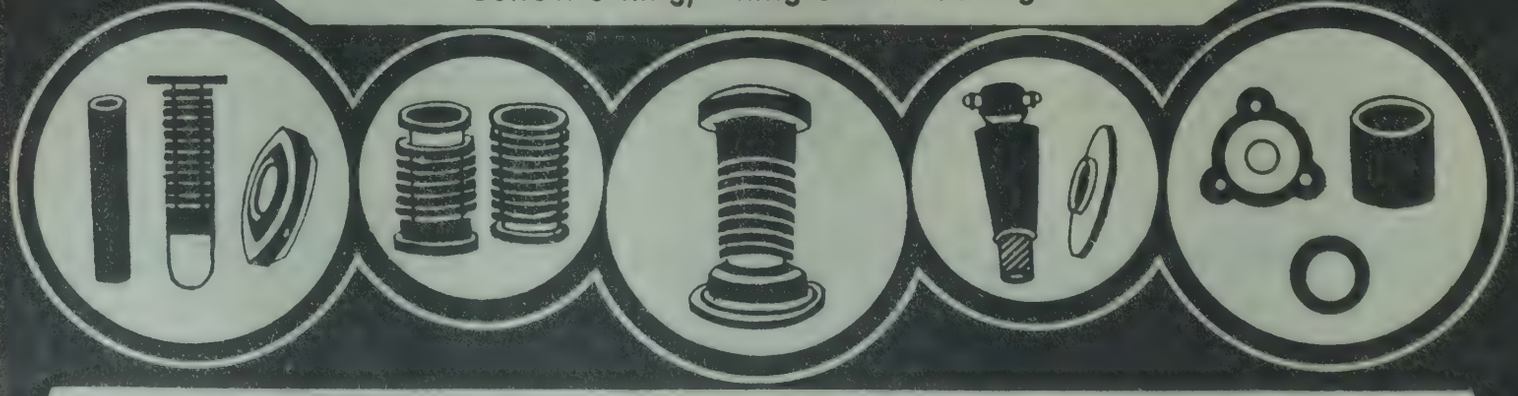
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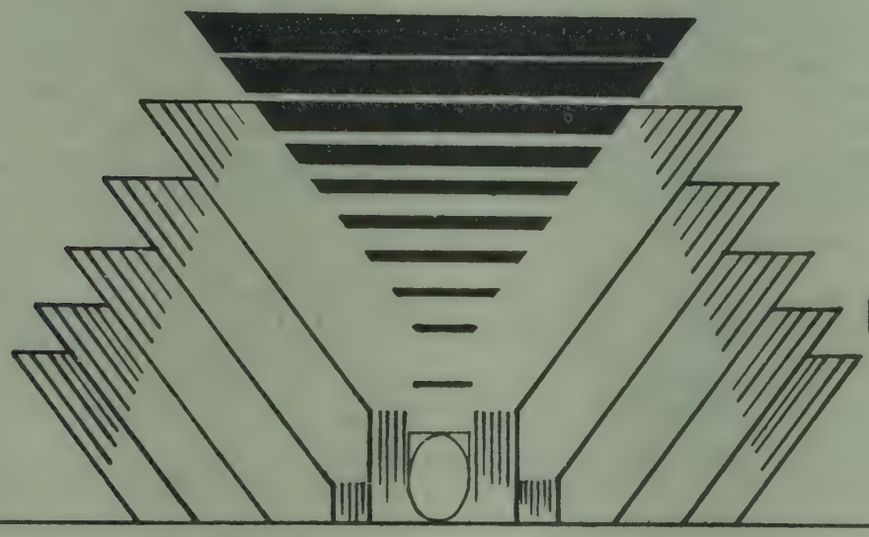
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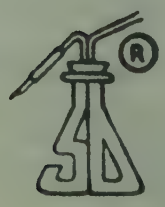
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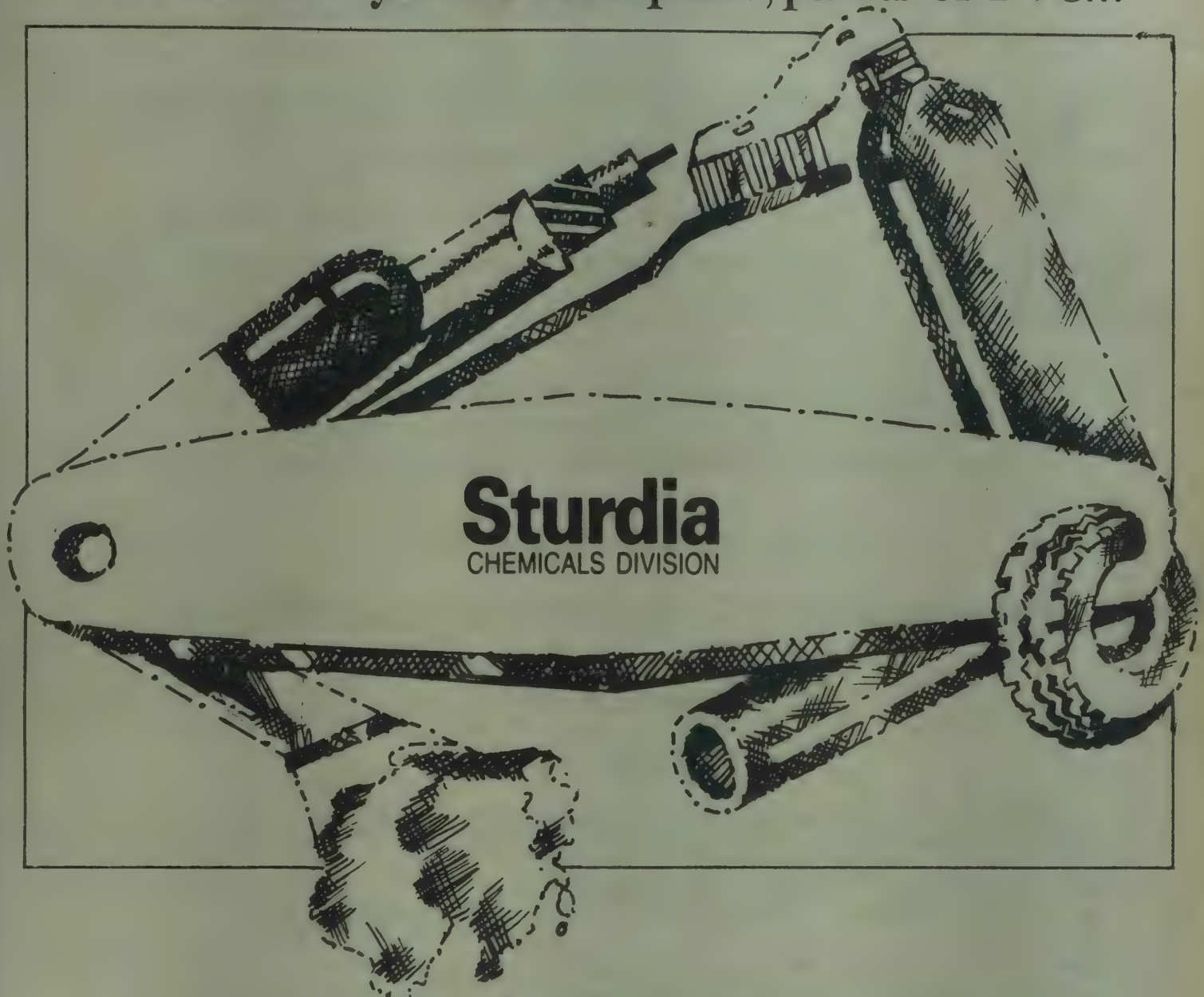
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CHEMICAL WEEKLY

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Ocean Floors -- Man's New Frontier

Ocean-bed mining is a new frontier that holds out considerable promise both for the developed as well as developing countries. After utilising the sea for centuries for purposes of food, transport and communications, mankind is now turning to the oceans for its growing requirement of chemicals, minerals and food.

The past three decades have witnessed man's successful efforts to exploit the oil and petroleum reserves in areas of the continental shelf; in the last two decades of this century man is turning his attention increasingly to the mining of the enormous quantities of polymetallic nodules which are reported to be heaped up on the deep ocean floor.

The sea bed is reported to constitute an abundant source of important metals such as manganese, cobalt, nickel and copper and to a lesser extent of rare metals like vanadium, zinc, lead and cadmium. The total reserves of nodules in the world's oceans are estimated to be around 3000 billion. Ocean floor geologists estimate that even if the mining of only 10% of the nodules turn out to be economic, sufficient supplies of many metals will be available from the sea bed, for hundreds of years at the present rate of world consumption.

The entire wealth of the sea has now come to be regarded as the heritage of mankind. The technologically advanced maritime nations, including the global superpowers have preferred to create an "Exclusive Economic Zone" (EEZ) of about 200 miles in respect of which the coastal states will have exclusive economic rights.

For the mining of the sea bed an International Sea-bed Authrorities (ISA) having overall control of exploitation of undersea mineral sources in the international zone has been created. The ISA has been empowered to grant licenses to private companies and to permit them to mine nodules subject to taxation and production regulations. In return the companies would make their technology and survey date available to the UN agency. The ISA's widespread acceptance of this principle that all states must submit their sovereign rights to the ISA is one of the major significant achievements of the third conference on the law of the sea.

Multinational companies from the USA, UK, USSR, West Germany, Japan have sunk about Rs. 2,500 crores in developing capacity to mine the nodules.

The Indian coastlines is 6,400 KM long on which 1200 islands are situated. India's exclusive economic zone covers an area of about two million square kilometers. The per square kilometer sea bed in India's continental shelf is likely to yield about 12,000 tonnes of manganese, 800 tonnes of aluminium, 920 tonnes of cadmium, 260 tonnes of iron, 160 tonnes of cobalt, 480 tonnes of nickel and 260 tonnes of copper. In addition there are about 220 million tonnes of offshore oil reserves and 1,30,000 million cubic meters of gas.

Presently no country in the world is capable of commercial exploitation of sea bed resources. The first and foremost challenge is to pool the global resources in terms of technology, finances, plant and machinery to arrive at a commonly acceptable programme and proceed with sea bed mining at selected spots on experimental basis to establish the economic viability of the process. The metal content of nodules in the Pacific Ocean is as high as 8%, whereas in the Indian Ocean the figure is less than half, 2.5 to 3.5%. The cost of dredging these nodules by India is currently estimated at Rs. 70/kg. Any venture on ocean bed mining would call for an investment of the order of $ 30 million on exploration of ocean minefield containing at least 5Kg of nodules per square meter with the content of metals being not less than 5% on an average. Further the site location should enjoy at least 200 days of good weather per year.

During the last two decades, international organisations, as distinct from member countries, are spending considerable sums on oceanographic research. In 1987,

40 countries operated such research vessels, the United States had 188, the USSR 110, Japan 42 vessels and France 30. The department of ocean development in India owns three such vessels, OBV Sagar Kanya, FORV Sagar Sampada and RV Gaveshani (CSIR Research Vessel). India also hires more vessels like GA Reay, Skandi Surveyor and Fernella.

The most important tools for scientific exploration in the years to come will be space satellites, and under water exploration robots. While satellites will provide long range views of the earth's surface, underwater robots will finally provide close-up knowledge of 70% of the earth, which lies underwater. It is no exaggeration to say that even today less is known of the undersea conditions than about the surface of the moon. France and America are rightly regarded as pioneers in evolving new tools to unravel the mysteries of the ocean floor. Two new Franco-American programmes have been launched to enlarge the understanding of the ocean world. This project envisages the launching of a satellite to draw up maps of global ocean circulation comparable to those drawn by metereologists for atmospheric circulation.

The other expedition will employ robots to examine the mid-Atlantic ridge. The primary objective is to measure surface topography -- the large and small variations in height of the ocean surface using newly designed radar altimeters and tracking instruments. The oceanographic scientists are now convinced that the ocean floor consists of hills and vales. Awareness of these variations in height will enable the scientist to predict more accurately the tides and currents. Together with measurements of ocean temperature and winds such knowledge will also add to our understanding of the ocean's role in climate. This in turn will enable the seasearchers to predict global weather phenomenon, such as the force and timing of India's monsoons and their relationship to "El Nino" the deep up swelling warm water currents that ruins fishing off the Peruvian Coast.

If the United States has pioneered satellite development, France can claim a similar role in undersea technology. The invention of the aqua lung by Jacques Cousteau and Emile Gagran, 45 years ago freed the modern diver from bulky suits, massive helmets and tethering hoses. Since then French divers and submersible vessels have participated in many of the momentous voyages of discovery and feats of ocean engineering. Many of France's exotic undersea vehicles, including some which have participated in epochal scientific discoveries are now available for scientific and commercial customers abroad. Nautile and Cyana are two elaborately equipped three men submersible vessels which can dive upto 20,000 and 10,000 ft. respec tively, observe and manipulate as directed. Epaular is an untethered remotely controlled submersible vess which can dive upto 20,000 ft., take television pictur and transmit them to the surface via an acoustic lin The US Navy recently chartered this vessel to locate th wreck of an aeroplane off San Diego while in anothe instance it was used to explore polymetallic nodules

Saga, is the latest among these quixotic submers bles which is designed for the offshore oil industry. Thi vessel will cruise 150 nautical miles and operate fo seven days under water without surfacing at a depth o 1300 ft. Six crew members will man the ship while si divers will work on offshore oil installation. A nev Fanco-American joint venture slated for 1990, aims a studying the geology, biology, chemistry and physics o the mid-Atlantic range. Another joint venture with Japar has explored the mechanics of volcanic and seismi activity adjacent to the Japanese Archipelago, part o the rim of the Pacific ocean, known as the 'ring of fire

These investigations help the modern scientist t reshape his views on the origin of life in this planet. Ev dence is now available of startling sea floor vents spout ing mineral rich brine at temperature around 600°F. Th regions surrounding these vents are populated by exoti biological species, such as giant worms and clams whic feed on sulphur organisms called thiobacilli, the botton link in a food chain that nourishes a surprisingly abun dant community of marine life. In the Pacific, a hithert unknown species of marine life, shell fish, which drav their sustenance by consuming methane gas. Thes discoveries have led some scientists to speculate tha organisms thriving on geothermal rather than sola energy may have been the first creatures on earth.

Thanks to the immense strides made by man i science and technology in the past four decades th world has expanded. Man has entered space thre decades ago and is also probing the depths of th ocean. Man's venture into space, it is feared, may lea to his own annihilation through star wars and intercon tinental ballistic missiles. But even a superficial exam ination of the probable fruits of man's venture into th bovels of the ocean, opens out a vast vista of wealt undreamt of hitherto.

Never before did man have so many resources at hi disposal to transform life of all mankind in a short spa of time. But one cannot overlook the distinct possibilit that man in his greed to exploit the wealth of the ocea may so upset the ecology of the underworld as to sea the doom of all mankind on the earth, below the sea an over the air.

-- T.P.S. RAJAN

CHEMARENA

S.L. VENKITESWARAN

Acetic Acid from Methanol -- Its Relevance

1. The approval of a few programmes for making acetic acid from methanol has come in for severe criticism due to this sudden shift in the policy of harnessing the sugar industry's by-product molasses for chemicals, particularly of acetic acid and acetaldehyde derivatives. This decision was apparently taken on the basis of a recent committee's views on the role of ethyl alcohol (from molasses) as a feedstock for chemicals. This committee apparently had totally divergent views than the several earlier committees on this subject, even the latest one under Sri A.K. Das, Industrial Adviser, DGTD, which had gone into this subject a few months earlier. What was surprising was the alacrity with which the suggestion of creating acetic acid capacity based on methanol was acted upon by granting approvals for 3 or 4 parties to a total of over a lakh tonnes of acetic acid from methanol. The approval of such a large capacity in this manner was also used as a reason for turning down more capacity based on alcohol in areas where adequate supplies of this were locally available.

2. India can boast of forging ahead with alcohol-based chemicals over a period of two decades and acetaldehyde and acetic acid have been exclusively made from alcohol derived from molasses. Over twenty plants have been installed and been in operation meeting fully the country's requirements at reasonable prices except in occasional years of fall in sugar production and consequent shortage of alcohol. More recently alcohol was allowed to be imported in bulk by the users to meet such a situation and the country's requirements of acetic acid were largely met.

3. It was rather unfortunate that some plants for converting alcohol into chemicals were located at centres with acute shortage of alcohol and based on supplies from other states which had a surplus. The most notable example of this is the polyethylene plant of ACCI (now Indian Explosives Ltd.) in Calcutta requiring alcohol supplies from UP or Tamil Nadu or other far off places. The capacity of this plant was increased in spite of clear warnings on the limits of alcohol supplies from the distant states. Capacity for acetic acid and its derivatives was also established in some states based on over-optimistic projection of alcohol availability. The result has been a few plants for acetic acid which can hardly operate for limited periods in a year and have gone out as sick units or just managed to survive. The State Governments have attempted to capitalise on their exclusive powers to tax potable alcohol and extended this power even where the use was industrial and not potable. The use of alcohol from one state to the benefits of another has caused resentment and consequent "export" levies on such alcohol to curb movements to other states so as to assist in the creation of capacity for alcohol based chemicals within the producing states. This was also the only way for such states to go in for some organic chemicals production even when petroleum feedstocks were not readily available in those states. Most of the problems related to shortages in sugar and molasses production once in 4 or 5 years, and the taxation by States even when alcohol was used for conversion to chemicals which were free of alcohol and hence their use for potable purposes was ruled out. The conditions have been changing from times of plenty (with exports of alcohol) to times of marginal shortages when import for industrial uses was permitted.

4. The approval of capacity based on methanol have been justified on the assumed inability of India's production based on alcohol linked to sugar to meet ever increasing demands and alleged high price levels. The argument of relatively low capacity utilisation levels is used both ways -- that creation of more capacity particularly in very large units is not warranted by the alcohol "lobby" or that the industry's lower capacity utilisation levels indicated inherent inability to meet new large demands such as for the pure terephthalic acid or vinyl acetate plants. Both arguments are only partly correct. If one were to eliminate the capacity which has been shut down, or which by the nature of their location can produce at hardly 30 to 40% levels if at all, and correct installed capacities to realistic figures consistent with best performance levels, then the capacity utilisation has been at reasonable levels and only limited by the demand. The lower production levels reported for some units may have excluded captive uses or not taken into account simultaneous production of acetic anhydride. Technologically and otherwise acetic acid plants based on alcohol are quite efficient -- particularly the more recent plants and the older plants can also be quickly stepped up in their efficiency at low additional costs.

5. The main question is on the availability of alcohol. For two years running now there is a glut in supplies of molasses and alcohol. In 1986-87 the production of alcohol was 616 million litres and demand was 320 for potable and 228 for industrial uses. In 1987-88 the estimate of production is 815 million litres with demands of 352 for potable and 402 for industrial uses. Even so, available molasses was not fully utilised. There is also a large carryover of stocks of molasses and alcohol and

shut-down of production and serious repercussions on sugarcane utilisation. In this worst drought year sugar production is setting a record of 9 million tonnes. More capacity has been licensed with a view to reach a 10 million tonnes sugar level in 1989-90 and at least 12 million tonnes in the early years of 8th Plan. One can certainly conclude that we are out of the earlier cyclical surpluses and shortage of molasses and alcohol. There are no prospects for exports of alcohol and the country has to use the production in the most appropriate way for chemicals of which acetic acid is the first choice. One would have thought that this reality would be basic to decide on any policy shift which would cut into the demand for industrial use of alcohol.

6. The other question is of demand. There is some controversy on the present production levels as indicated by the Government or by the AABIDA, perhaps due to some captive use or acetic anhydride production not being accounted for. But there is general agreement that the production should go up by about 30,000 tonnes/year in the next few years. The rate of growth of new uses -- vinyl acetate of PTA -- is a bit uncertain and the demand could go up to even 40,000 tonnes, which is as much as 80% of the capacity of one methanol-based plant. Are we to give priority to such a single programme when new capacity of 6000 to 8000 tonnes a year could be installed every year to meet the growth in demand or are we to have this single plant based on methanol to come up at one go after 3 years? If alcohol-based capacity is also allowed simultaneously it will lead to low capacity utilisation levels and higher costs in all plants -- the very complaint being made against present alcohol-based production.

7. It is also to be noted that while the alcohol-based plant needs no foreign exchange whatever the methanol based plant requires a reported Rs. 8 crores for technology and Rs. 25 crores on imports of equipments -- precious foreign exchange which the country cannot afford to be squandered for a product where there is no need to allow any foreign exchange -- to build up adequate capacity.

8. An argument advanced with great vigour is the need for updated technology of the latest variety for the country's economic progress. Technology cannot be considered in isolation for technology's sake but has to be examined in the context and circumstances of the country. Here we have an efficient process for converting a waste product of the sugar industry into acetic acid at no foreign exchange cost and at prices which will be lower than when produced in India using the latest technology which was developed in a different context in the western countries when ethylene prices shot up and acetaldehyde from ethylene was no longer economic as an intermediate for acetic acid. It may also be noted that acetic acid from butane continues to be produced and has not been completely displaced by methanol-based production in the West. Even a plant based on butane which suffered a serious mishap is to be rebuilt on the butane-based technology which was found appropriate to the location and conditions. It is time that we do not get carried away by a craze for "high-tech" without a clear analysis of the circumstances and correct evaluation of the benefits.

9. It is correct that recently what is called C-1 chemistry or chemicals based on synthesis gas or methanol has shot into prominence. Acetic acid and acetic anhydride are the prominent successful items which are commercial now and intense R&D is in progress on other chemicals via methanol -- ethylene, or ethyl alcohol, ethylene glycol, vinyl acetate, aromatics and so on. Whatever new technology may emerge on this route has to be studied in the context of our economy and adopted where necessary. Ethylene glycol is perhaps likely to be the next big item to be made via synthesis gas. We do not need to make ethylene or ethyl alcohol via synthesis gas or methanol in view of our better and renewable feedstock situation.

10. There is also undue emphasis on economies of scale as if this were something abstract. Minimum economic capacity levels have no doubt to be kept in view but the minimum is dependent on technology and raw materials. In the case of methanol-based process the minimum is 50,000 TPA while when based on alcohol it can be even 4,000 TPA and at lower investment per tonne/year capacity.

11. The alternate raw materials methanol and alcohol (ethanol) also have relevance. Methanol is based on natural gas or naphtha. Natural gas is available in plenty and it is not as if the gas will have to be flared away if not converted to methanol or ammonia as in the case of associate gas or crude oil. We can suit the withdrawal of natural gas to the actual needs and thus extend the availability of supplies over longer periods. For naphtha we are dependent partly on the import of crude oil. On the other hand, for alcohol we use a waste product of sugar from the annual renewable plant source of sugarcane. Certainly the use of alcohol should get preference over the use of a depleting resource such as natural gas or petroleum.

12. The minimum economic capacity for methanol is now said to be 200 TPD but this decision has come after several plants have been put up at 30 to 50 TPD levels and one of even 10 TPD. These units cannot be changed to 200 TPD and they have to scrap the small units and install the larger plants. But in the process the installed capacity for methanol will go up to double or triple of present demand. The larger plants may thus end up in higher costs and not to any lower price levels. The problem of finding new uses for methanol has led to the acetic acid option but it is obvious that hardly 10% of the methanol can end up as acetic acid even 5 years after creating or approving large excess capacity for methanol in the name of economic capacity and also has undesirable complications.

13. It is to be hoped that Government authorities will take a fresh look on the important question of acetic acid capacity based on methanol in India.

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UCC directed to pay Rs. 250 cr. interim relief

Upholding the liability of the Union Carbide Corporation (UCC) in the Bhopal gas leak disaster, the Madhya Pradesh High Court directed it to pay Rs. 250 crores as "interim payment of damages" to the gas victims on April 4.

Mr. Justice S. K. Seth of the High Court further directed the Union of India — the representative of the victims — to execute the order as if it were a "decree passed in its favour" and observed that any delay in extending the appropriate relief by way of interim payment of damages woud have "grave and tragic" consequences.

The case arose out of the civil revision petition filed by UCC against the Bhopal District Court order directing it to pay Rs. 350 crores as "interim relief" to the gas victims.

The UCC had argued that the Bhopal Court had neither power nor jurisdiction for ordering the interim relief and there was no provision for such relief under the Bhopal Gas Leak Disater Act.

It was further argued that Bhopal's district Judge M.W. Deo, who passed the order on December 17 last year directing UCC to deposit Rs. 350 crores within two months, had prejudged liability even before discovery, framing of issues and evidence.

Mr. Justice S.K Seth, however, concurred with the direction of the District Judge, but reduced the quantum of relief as interim payment of damages to the victims by Rs. 101 crores after taking into account the "needs of the victims category-wise".

Mr. Justice Seth granted UCC two months' time from deposit the amount (Rs. 250 crores)' in the trial court.

He, however, held that the said payment was not a payment of interim relief without reference to the merits of the case as held by the trial court, but was a payment as damages under the substantive law of torts on the basis of more than prima facie cases having been made out in favour of the Union of India to receive such payment from UCC.

Mr. Justice Seth said the measure of damages payable as per the nature of tort involved in the suit had to be correlated to the magnitude and the capacity of the enterprise because such compensation "must have a deterrent effect."

It was on record that UCC, he pointed out, was a financially sound corporation having more than Rs. 8,515 crores worth of unencumbered assets and Rs. 262 crores worth of insurance coverage.

There was good reason to believe that the insurance coverage covered the risk in respect of claims arising out of the Bhopal disaster also.

Mr. Justice Seth said the four categories the victims — death, total disablement resulting in the permanent disability, permanent partial disablement and temporary partial disablement could be made the basis for the determination of the quantum of interim payment.

Thus the payment of damages payable by UCC in respect of each of the four categories would be Rs. 1 lakh in each case of death, Rs. 1 lakh in each case of total permanent disablement, Rs. 50,000 in each case of permanent partial disablement and Rs. 25,000 in each case of temporary partial disablement, he added.

The Union of India in a statement before the court had submitted that a total of 2,660 persons died and between 30,000 to 40,000 sustained serious injuries as a result of leakage of lethal methyl isocyanate (MIC) from the Bhopal pesticide plant of UCC on the night of December 2, 1984.

Mr. Justice Seth further directed the Commissioner, functioning under the Bhopal Gas Leak Disaster (Processing of Claims) Act to have the work of registration of claims (including scrutiny and proper categorisation) in respect of deaths and personal injuries completed with in a period of four months from the date of deposit of the said amount by UCC in the trial court.

As soon as the amount was deposited the trial court should give intimation of the said fact to the Commissioner and on a demand being made by the Commissioner for the purpose it should make the amount available to him for making disbursal of the same.

Similarly, as and when disbursal of any amount was made to any claimant, he should furnish full particulars regarding the same to the trial court through the Union of India, Mr. Justice Seth said.

The judge asked the trial court to proceed with the trial of the suit with adherence to the findings on relevant questions of law given by the High Court.

He further directed UCC to pay Rs. 10,000 as costs of the civil revision petition to the Union of India

Observing that Mr. Vibhuti Jha, counsel for the intervenor — Bhopal Poisonous Gas Disaster Struggle Front — had brought to the notice of the court certain factual aspects of the case which had been "useful in disposing of the revision," Mr. Justice Seth ordered UCC to pay Rs. 2000 as costs to Mr. Jha

In his 101-page judgement, Mr. Justice Seth also assailed the Union of India for its stand taken before the American court to get over "forum non-conveniens".

He said the high court could not restrain itself from expressing its "shock" over the manner in which the sole object of getting over what appeared to be an incontrovertible plea of "foreign non-conveniens" was raised by UCC before the American court in 1986.

The Union of India, he observed, under-rated its own judiciary and made it a subject matter of ridicule so publicly before a foreign court.

It was ironical that it was left to UCC — which is a foreign corporation, to come to the rescue of the prestige of the Indian judiciary by filing the affidavits of two eminent Indian Jurists — M. N. Palkhiwala and Mr. J. P. Dadachanji.

CIL LOSSES

Coal India Ltd as a whole, has been incurring losses after nationalisation except during 1981-82, the Minister of State for Coal, Mr. C. K. Jaffer Sharief, said.

The losses were Rs. 78.03 crores in 1984-85, Rs. 404.18 crores in 1985-86 and Rs. 331.75 crores in 1986-87, the Minister said in a written reply.

The main reasons for the losses were increase in the wage bill, increase in the cost of other inputs and higher production of inferior grades of coal.

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Dr. O. P. KHARBANDA

Frankly Speaking

DR. O. P. KHARBANDA
Cost & Management Consultant,
501, Olympus, Altamount Road, Bombay-400 026.
(An author of repute and a visiting professor. Dr. Kharbanda consults worldwide including to UNIDO.)

Electronic Mail Is Here

Indeed, electronic mail is here and to stay with us for good. Its quick and cheap and getting cheaper still. This is the message of two articles (Jean Datta : Improving written electronic communications, page 21-3 & Erik Mortensen : Adapting electronic mail to management's needs page 26-31) on the subject in the Administrative Management of August 1987.

What exactly is electronic mail? It is the popular term for newer forms of communications evolved through the 'marriage' of computer and te'ecommunication technologies. This has proved to be so cost-effective, that the price tag is practically down to the level of a postage stamp, and it has gained immense popularity. As of Jan. 1987, there were an estimated 5 million users of electronic mail in North America, comprising of 3.75 million internal systems and 1.25 public services. Currently, some 500 million messages (excluding bulletin boards and telex traffic) are being transmitted annually, with a projected 2 billion by 1991. Naturally, such large activity in the field has led to the formation of a Washington-based trade association, The Electronic Mail Association, who define Electronic mail as :

> the generic term for the noninteractive communication of text, data, images or voice messages between a sender and designated recipient (s) by systems utilising telecommunications links.

EMS (electronic mail system) includes such diverse technologies as telex, facsimile, microcomputers, communicating word processors, a variety of computer-based message systems, electronic document distribution (including hard copy delivery) and voice storage-and-forward technologies. The developments leading to the EMS can be traced back to the invention of telegraph (1840's) and introduction of telex in the 1930's.

One important difference, however, should be noted. Telex usually requires specially trained office personnel, whereas EMS is normally part of a manager's workstation and fits into manager's normal office routine. Facsimile (FAX) is a proven and effective technique and is also by far the most flexible and inexpensive form of electronic mail. It is the right 'tool' for most companies, the distance between two FAX units is irrelevant and it is truly a 'turnkey' technology. Not much training is required, in fact, some machines can operate completely unattended, and they can be used mostly during the low-rate periods through various options such as store-and-forward. In effect, FAX machines can be looked upon as 'long-distance copiers'. To be most cost-effective, the message must be in clear, precise and explicit prose, and also it must be right the first time. Care and attention at this stage can pay enormous dividends, e.g., :

* Think before writing and be clear as to what you want to convey
* Who are your readers? Give them just what they need, and no more
* Short messages, but sharp, simple, clear and direct
* Reread your message, also let a colleague read it beforehand.

Above all, no matter how advanced or effective the technology, it may prove far too expensive and even useless unless the sender and recipient of the message are on the same 'wave length' and they speak and understand each other's 'language'. EMS is stated to be 'spreading like wildfire', thanks to the rapidly declining cost (a short message costs 45 cents, 1,10th of the cost 4 years ago). Products for broader consumer use and an Open System Interconnection to enable different types of machines to work together, seem most promising. What, more? No limit !

LOAN LICENSING AGREEMENTS:

Plea to rethink abolition

The abolition of loan licensing agreements by 1990, announced by the Union government recently is an extremely unwise step and would only retard the growth of the Indian drug industry, Mr. Vinoobhai U. Shah, president of the Indian Drug Manufacturers' Association (IDMA) said.

Pleading for serious review of the government's decision, Mr. Shah told newsmen, the phasing out of such agreements would result in closure of 8,000 small-scale units and atleast three lakh people would lose jobs.

He said loan licensing arrangements were not peculiar to India. It was widely prevalent in United States and the west. The existence of such arrangements under which drug manufacturers could get products manufactured on job basis outside their factory premises have been largely responsible for the impressive growth of the Indian drug industry over the years.

Mr. Shah pointed out that the loan licensing facility avoided the problem of under utilisation of capabilities and ensures steady supplies of drugs. It also acts as a break on price increases. If the units were being asked to close down because quality of the product was suspect, Mr. Shah said there had been no complaints on this ground so far. Besides, since it was a question of their survival, the units always made concerted efforts towards quality reliability. He also said the production was only on job basis, no marketing by the unit was involved.

Referring to the new drug policy, he said prices of drugs and medicines have increased and were bound to increase further as the recent increase in the excise duty would further escalate costs. Since the policy suffered from certain inherent shortcomings it would not contribute sufficiently to overall growth of industry.

Mr. Shah said the five per cent Central excise duty on life saving drugs and intermediates would prove to be counter-productive and would affect the small scale units who would either have to cut down the production or wind up their units. Besides the facility that was granted to small scale units of excise exemption upto Rs. 15 lakhs was denied to the loan licensing units. Government should consider loan licensing units as small scale units and grant this excise benefit to them.

In the budget the government had also levied Central excise on all bulk drugs which were consumed by the drugs and formulations excluding 26 people in a sustained and longer period of treatment. It is surprising that the life-saving drugs like ampicillin, amoxycillin, erythromycin and other antibiotics which were hitherto considered essential and were exempted from excise duty, now attract 5 per cent on raw material, 10 per cent on single ingredients and 15 per cent on combinations.

NICKEL PRICE RAISED

The official pricing committee for imported non-ferrous metals has hiked the prices of nickel by Rs. 1 lakh per tonne. There has also been a marginal increase in the price of zinc while a small reduction has been made in the price of continuous cast copper wire rods. Also, the rates of antimony metal have been omitted from the official list.

As per the official announcement, the new prices for nickel briquettes and squares would be Rs. 3,50,000 per tonne, up from Rs. 2,50,000 last month. Similarly, nickel pellets/F.shots/strips would now cost Rs. 3,52,000 per tonne against the earlier price of Rs. 2,52,000 per tonne.

In the case of electrolytic high grade zinc, the new price has been fixed at Rs. 35,500 per tonne, up from Rs. 34,000 last month. Similarly, special high grade zinc would now cost Rs. 35,700 per tonne against the earlier price of Rs. 34,200.

In the case of copper, while the price of electrolytic wire bars/high grade cathodes has been retained at Rs. 73,000 per tonne, that of continuous cast copper wire rods has been marginally reduced to Rs. 80,000 per tonne from Rs. 81,500.

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POLIO VACCINE :

USSR offers technology

The Soviet Union has offered India the technology for the manufacture of polio vaccine in the manufacture of also train Indian scientists and technicians in setting up the plant for the manufacture of the vaccine. However, the Indian side, it is understood, would, after the training, be free to either utilise Soviet equipment or equipment from any other country in setting up the polio vaccine plant. Talks for this are already underway in New Delhi.

The Soviet Union has also offered to continue the supply of polio vaccine to meet India's requirements till such time as the plant is set up in India. Moreover, the USSR will also be in a position to increase production to cater to the needs of India till 100 per cent indigenisation is reached.

The Soviets are the pioneers in the manufacture of polio vaccine with their plant going on stream as far far back as in 1959. Currently, that country is exporting 45 per cent of its output, which accounts for as many as 50 million oral doses, to 20 countries including India, Brazil, East European and African nations.

In an exclusive interview with The Economic Times, Dr. Igor N. Denisov, deputy minister of health of the USSR, pointed out that the Soviet Union will give the technology for the manufacture of the polio vaccine free of cost. He was in New Delhi to hold talks with officials to reach an understanding on the project. Talks are also going on with the department of biotechnology for training adequate manpower.

The minister said the Soviet polio vaccine met international standards and during the last three decades, the Soviet plant had undergone technology upgradation to meet the changing demand and situation.

Asked whether the Soviet Union would like to set up a joint venture with India in setting up the polio vaccine plant, the minister said that the USSR would merely transfer the technology. He also declined to indicate what kind of investment would be needed to set up plant in India. However, he stated that such a plant is expensive and requires trained cadre of scientific personnel as the vaccine requires to be produced under cooler conditions.

The vaccine can be stored for upto a year under plus-four degree Centigrade temperature.

I.I.CHEM.E. COURSE ON PROCESS CONTROL'

The Indian institute of Chemical Engineers, in collaboration with the British Council, are organising a three-day course on 'Chemical Process Instrumentation — Measurement and Control' by Dr. Martin John Pitt, of the University of Leeds. The course will be held at the Sea-Rock Hotel, Bombay from April 18-20, and the course outline is as follows:

Day 1: Temperature, Pressure and Flow

Day 2: Level, Weight and On-Line Analysis

Day 3: Computer Control, Intrinsic Safety and Statistical, Process Control.

Fees for the course including costs of course materials, lunch and refreshments are:

For members of the Institute Rs. 1,200

For non-members: Rs. 1,500

Further details can be had from: Prof. K. K. Tiwari, Dept. of Chemical Technology, University of Bombay, Maturga, Bombay-400 019. Tel: 477391/484306/484556.

LUBRICATING OILS, GREASES ORDER AMENDED

The Union government has decided to amend the Lubricating Oils and Greases (processing, supply and distribution regulation) Order, 1987. It has decided to introduce a new application form for sellers for grant of licence and also to clarify the terms lubricating oil/grease and processor, according to an official release issued in New Delhi on March 31.

The date by which existing processors have to take licence under this order has been extended till June 30, 1988 in order to give more time to the state governments to issue the licences. The notification amending the above order has been published in the Gazette of India Extra ordinary

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Decision on changes in DPCO soon

The Union Industry Ministry is expected to take shortly a decision on 55 representations from various quarters demanding changes in the Drugs (Prices Control) Order (DPCO), 1987. Most of the representations relate to classification of drugs into price-controlled categories.

Kelkar Committee, which was asked to look into these representations, is believed to have finalised its recommendations and is expected to submit its report to the Government soon.

The Committee on identification of Category II price-controlled drugs, headed by Vijay Kelkar, BICP Chairman, was retained by the Department of Chemicals and Petro-chemicals after announcement of new DPCO in August 1987 with a view to solving any problems faced in its implementation.

Taking advantage of this arrangement, 22 companies, 25 Members of Parliament and six industry, medical and consumer organisations submitted representations to the Department.

Most of the companies representation have sought to shift one bulk drug or the other from Category-I to Category-II or from Category-II to the remaining category of drugs exempt from price control.

Three companies, for instance, want paracetamol to be shifted from Category-I to Category-II, the group which contains all other analgesic and anti-pyretic drugs. The shift will mean higher mark-up on formulations made from the bulk drug. The formulations made from Category-I bulk drugs are allowed a maximum allowable post-manufacturing expense (MAPE) of 75 per cent and those produced from Category-II bulk drugs are allowed 100 per cent MAPE.

It is pointed out that if paracetamol is retained in Category-I, then its manufacturers will be put in a disadvantageous position vis-a-vis the companies producing the substitutes.

In the erstwhile DPCO, 1979, all analgasic and anti-pyretics were placed in Category-III and, thus, were allowed a mark-up of 100 per cent.

Similarly, Tarai Farmers' Association has demanded that menthol be exempt from price control by taking this drug off from the Category-II.

Some representations have found fault with the criteria adopted by the Committee for inclusion or exclusion of drugs into Category-I and II.

PLASTIC INDUSTRY SEEKS PARITY IN INPUT PRICES

The country's plastic industry has suggested to the Government to bring about parity in the prices of imported and indigenous raw materials in the interest of the growth of the indusrty.

In a memorandum submitted to the Union Finance Ministry last fortnight, the industry has argued that the recent reduction in the duties on various polymers like low density polyethylene (LDPE), linear low density polyethylene (LDPE) High Density Polyethylene (HDPE), polypropylene (PP), and PVC had been wiped out by the skyrocketing prices in the international market.

In the industry's view if the cost of the imported material was not brought to a level comparable to that prevailing in the domestic market, the going would be tough. The prices of indigenous material had already been raised by 25 per cent last year, the memorandum pointed out.

The memorandum had been jointly submitted by the All-India Plastic Manufacturers Association, Indian Plastics Federation, Organisation of Plastic Processors of India, All-India Flat Tape Manufacturers Association, and the Vidharba Plastic Industries Association.

While the total landed cost for LDPE, HDPE, PP, and PVC were Rs. 29,059, Rs. 29,780, Rs. 28,588 and Rs. 23,974 per tonne respectively, the indigenous price per metric tonne averaged around Rs. 27,000, Rs. 27,500 Rs. 30,000 and Rs. 22,000 respectively.

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Non-molasses-based alcohol : price, capacity curbs relaxed

The potable alcohol produced under the liberalised licensing policy will not be subjected to price control for the time being.

This is stated in a press note, issued by the Industry Ministry in New Delhi recently to give effect to the Government's liberalised licensing policy announced last year. The policy had allowed creation of additional capacity for manufacture of potable alcohol, provided the raw materials are other than molasses.

The press note says that the total ban on creation of additional capacity has now been relaxed to provide for setting up of new units and expansion of existing units for the manufacture of potable alcohol based on non-molasses raw materials.

Such raw materials will include potatoes, tapioca, mahuwa flowers, cashew apple, sugar beet, beet-root, fruits of various types, coarse grains (maize, jowar and bajra), wheat and rice.

The potable alcohol industry would, however, continue to remain in schedule IV of the Government's exemption notification of February 16, 1973 as amended from time to time. It will, therefore, be obligatory to obtain an industrial licence under the provisions of the Industries (Development and Regulation) Act before setting up capacity in this line of manufacture, irrespective of the level of investment. Even small-scale units, desiring to take up manufacture of this item would be required to obtain industrial licences.

The press note further stipulates that the relaxation in the ban applies only to non-molasses based alcohol and the ban continues to operate in so far as molases-based alcohol and beer are concerned.

Interested entrepreneurs may now apply for grant of letters of intent in the prescribed format to the Secretariat for Industrial Approvals in the Department of Industrial Development with the requisite fees. One copy of the application should be sent by the applicants to the nominated authority such as the excise commissioner of the State Government concerned.

The recommendation of the commissioner for proposals for letters of intent is necessary from the point of view of continued availability of the requisite quantity of raw materials.

The applicants should preferably go in for a composite technology allowing for use of various types of raw materials throughout the year, so that the manufacturing units do not have to depend on one raw material or its availability from other States.

The decision to relax the ban on additional capacity creation to produce potable alcohol based on non-molasses was taken to make available additional quantum of molasses for manufacture of industrial alcohol and at the same time to reduce illicit distillation of Alcoholic drinks.

Through a press note issued on November 19, 1975, the Government had banned creation of additional capacity and expansion of existing capacity for distillation or brewing alcoholic drinks except in 100 per cent export-oriented units.

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7.5 P.C. DISCOUNT ONLY ON UREA:

Govt. to reimburse fertiliser cos.

The Union government has decided to reimburse to fertiliser manufacturers the 7.5 per cent discount offered by them to farmers. It has also been decided to confine the discount only to urea in conformity with the commitment made by the Union finance minister in his budget speech.

These decisions were taken at a meeting of fertiliser manufacturers convened by minister of state for fertilisers R. Prabhu recently. The outgo on account of the 7.5 per cent discount on urea is calculated at around Rs. 215 crores during the year.

The government has asked the Fertiliser Association of India (FAI) to work out the mechanism in consultation with government officials. However, it has been decided that the reimbursement will be made after the sale of urea has been made to the farmers and not after it has been manufactured.

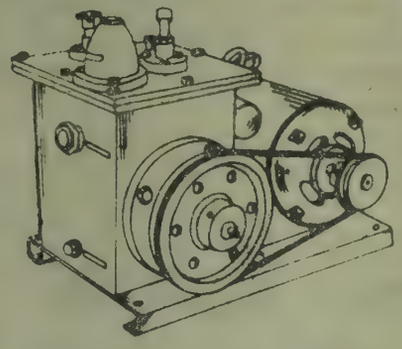
The government has also decided to reimburse the manufacturers according to the price paid by the farmer. The reimbursement will be made by the fertiliser industry co-ordination committee (FICC). It will be made on all the sales of urea conducted after April 1, 1988.

That the discounts will be offered on the sale of urea and no other fertiliser has not come as a surprise. Union finance minister N. D. Tiwari, in his his budget speech had made it clear that the discount will be only on urea. He had said in order to further reduce the cost of inputs, the government is asking the fertiliser companies, both public and private sectors, to give discount of 7.5 per cent over notified prices for coming kharif and rabi sowings. This will reduce the price of a bag of urea by around eight rupees and eighty paise."

But doubts arose when companies in the co-operative and public sectors, in their unexplained hurry to "welcome" the discounts, offered these on all types of fertilisers and issued advertisements in leading newspapers to this effect.

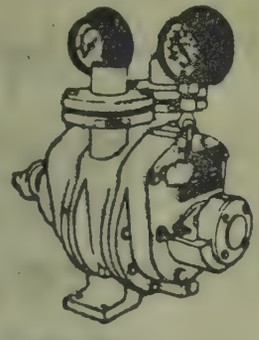
The first indication of the government's intention of compensating the companies for the 7.5 per cent discount came on March 18, when Mr. Tiwari told the Lok Sabha that the government will undertake a review to see if the 7.5 per cent discount on fertiliser prices announced in the budget speech can be covered in the allocation of Rs. 3,000 crore made for the fertiliser subsidy.

He had said it should be possible to absorb the outgo on account of discount in the fertiliser subsidy itself. This statement was taken by the industry as an indicator of the government's willingness to take on the burden of discount on itself rather than making the manufacturers pay for it.

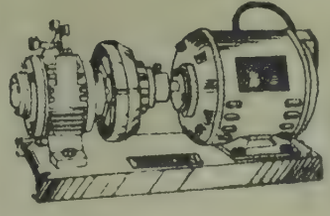


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FERTILISER SUBSIDY TOUCHES RS. 2,200 CRORES

Subsidy of Rs. 1,900 crores and Rs. 2,200 crores on fertiliser sales were given by the government during 1986-87 and 1987-88 respectively, the Lok Sabha was told on April 4.

The state governments, where fertilisers are subject to tax under the state Sales Tax Act, have been requested to exempt fertilisers from the purview of sales tax and other levies or to reduce their rates to the minimum possible, minister of state for agriculture Shyam Lal Yadav told Mr. Prakash V. Patil in a written reply.

The state governments concerned are not in favour of any reduction due to financial constraints, he added.

NEW IFFCO CHIEF

Mr. Ghanshyam Singh, member of Rajya Sabha, was elected as the new chairman of Indian Farmers Fertiliser

Course on energy utilisation in chemical industry

The Technology Advance Centre, Madras (TAC) after its establishment as a Registered Trust Foundation in 1987 to advance science and technology by utilisation of the best expertise in the country in the fields of chemical technology, electrochemical technology and anti-corrosion technology has successfully conducted two 3 day courses on (1) Corrosion Control and (2) Electroplating and Metal Finishing. It now proposes to conduct a high level course on 'Energy Utilization in Chemical Industry' for the benefit of managers and high level technical staff in the chemical industry. This course will also be of 3 days duration and will consist of 12 lectures by top experts of the country in the panel by TAC and outside. This 3 day course will cover efficiency in power generation and steam generation, design of equipments and their operation to reduce energy consumption, energy management and audit, high temperature insulation to make energy savings, Indian coals and synthetic liquid fuels, and waste heat recovery. In addition, a survey of energy resource in India and the prospects of hydrogen economy will be dealt with. The course will begin with a lecture on the outlook of the future: Technoeconomic options and opportunities.

The course will be conducted in Madras, course fees will include lunch and two teas in addition to a compilation of the lecture material. The registration fees for the course is Rs. 1,500/- per participant.

The course is programmed to take place in the first half of 1988. The dates and venue of the course will be decided after ascertaining the response of the chemical industry to the course.

Those industries which wish to sponsor candidates for the course may please send Rs. 1,500/- per candidate by demand draft to the Executive Vice President, Technology Advance Centre, First Floor, 'Sabaree', 14, 2nd Street, East Abiramapuram, Mylapore, Madras-600 004 before 15th April, 1988. The draft should be drawn in favour of Technology Advance Centre, Madras.

COURSE SYLLABUS

1. Outlook of the Future Techno-Economic Options and Opportunities : H. S. Rao

Ergonomics-Energy Economy-Lower Energy Consuming Alternative Routes in Chemical Synthesis-Illustrations with specific case histories of technological options for chemical synthesis giving alternative production systems with investment information and energy costing — coal, oil, natural gas and agro-products as basic inputs for energy generation and carbo-chemical/petrochemical production. — Cost effective decision making and efficiency audit — newer energy saving opportunities in the electrochemical industry — what biotechnology can do for you to cut costs in organic synthesis.

2. Indian Coals and Their Utilisation in Chemical Industry : R. Vaidyeswaran

Coal is the most abundant fossil fuel resource of the country. It should be utilised fully in the chemical industry for energy purposes besides as a raw material. Indian coal is inferior in grade and occurs in certain parts of the country only. The parameters used to classify coal as well as the methods useful for its exploitation in the chemical industry as a source of energy are discussed.

3. Energy Management and Audit T. R. Viswanathan

Energy Audit — study of energy balance in plants, processes and systems — in-depth analysis-recovery of waste heat-reduction in energy usage by modification of process by improving yields by more efficient equipment, by measuring and controlling operating parameters and with cheaper energy sources — evaluation of new investment for energy savings — improved operation and maintenance — management efforts in optimising energy utilisation.

4. Survey of Energy Resources in India: Dr. H. S. Rao

Coal-oil-natural gas-present distribution of resources, availability and futuristic forecasting-agrowastes for energy generation-prime movers based

(Contd on P. 50)

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38TH ANNUAL GENERAL MEETING OF DMAI

Dyes industry assured of help

Mr. Raghunandan Lal Bhatia, Member of Parliament assured the members of the Dyestuffs Manufacturers Association of all possible help in meeting their demand with the Government. The industry's demands for concessional excise duty, exemption increase from 15 lakhs to 30 lakhs and proforma credit for exports not utilized, have already been met, he said. Mr. Bhatia was addressing the DMAI members at the 38th Annual General Meeting held at Bombay on 30th March 1988.

Earlier at its business session, the DMAI, elected Mr. Anil Mehta of Dyetex Corporation as its new president for the year 1988-89.

Mr. Satish Sehgal, jt. Hon. Secretary of DMAI introduced the Chief Guest with a brief biodata. The outgoing president Dr. Bakul Patel also addressed the meeting. Mr. Prakash Khatiwala, Managing Director of Arlabs Ltd., read out the names of DMAI Award winners. Mr. P. R. Rastogi, Vice President of DMAI proposed a vote of thanks.

Mr. Bakul Patel's Speech :

In his speech, the outgoing president of DMAI, Dr. Bakul Patel said that he was happy to have served the dyestuffs industry in the capacity of DMAI President for the last three years.

Looking back, Dr. Patel was content to note that the industry had progressed from the state of utter disappointment to a highly favourable stage of dyes industry. Exports front had picked up and was doing very well. The progress had been tremendous. The country had emerged as a reliable supplier of dyestuffs. New entrepreneurs had come up in large numbers with new innovative products. The past three years had been a period of steady growth considering the foundation, he said.

Dr. Patel said that at DMAI efforts had been made to try and solve the problems of the industry by holding seminars and meetings on various topics. Many important suggestions had come up. "When we are expanding, there will always be some problems also", he said.

Speech of Mr. Anil Mehta :

Mr. Anil Mehta, who had taken over again the mantleship of DMAI President after six years, has remarked that he was again assuming the charge and promised to fulfil the responsibilities and challenges that lay ahead.

Mr. Mehta said that his first task would be to increase the membership to little more than 200. He hoped by the end of 1989, the strength should reach around 250 to 300.

He said that there had been a hue and cry about the non-availability of basic raw materials and penultimate intermediates. And there had been major exports of certain important intermediates, starving the indigenous dyes industry. "Though we need more and more exports, the export should not be at the cost of local industry" he said. We should get assurance from the manufacturers of the continued supply of goods for the local industry. To this we might have to involve Government agencies", he opined.

Mr. Mehta was happy to note the excellent performance in exports. This would likely to continue few years more. The exports of dyes had reached Rs. 90 crores in 1986-87, and likely to cross Rs. 140/- crores in 1987-88. There was still some scope. By the year 1990, he would not be surprised, if the figure crossed Rs. 200/- crores or so.

He further said :

The DMAI would set up an Export Pannel to sort out various problems of the exporters. An Export Promotion tour would also be arranged in the last quarter of this year. The industry was facing many hurdles after having had a haphazard growth. The industry had a social obligation to mitigate the problems of pollution and abide by rules and regulations. The industry was trying to represent at various levels in the Government. In this connection he was happy to note that the Gujarat Industrial Development Corporation (GIDC) is providing centralised facilities for efficient treatment to small units who found it difficult to fulfil environmental regulatious and hoped that authorities in Maharashtra would follow the same.

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Mr. Anil Mehta advised the new entrepreneurs who were contemplating to put up plants for manufacturing dyes and dye intermediates should study the overall aspects of the industry before they ventured into it. The technology and financial capacity pollution and environmental aspects, have to be thoroughly studied. New entrepreneurs were urged to study the above aspects before they thought of any venture.

Chief Guest R. L. Bhatia's Speech :

Addressing the members of DMAI, the Chief Guest Mr. R. L. Bhatia traced the progress of the Indian industries in general. Despite success in infra-structure facilities, there were still some gaps, he said. In spite of temporary set-backs, with the worse drought situation, the Industrial sector had done well. The power sector had performed satisfactorily. The exports had shown a remarkable progress and risen to 22% more than previous year. The over all growth rate was 6.4% during 1986-87.

The steady growth of the small scale industry over the last 15 years was good. The number of units had risen to 14.5 lakhs producing Rs. 72 thousand crores worth in 1986-87. The exports had been steadily rising. Many products had been brought under ISI certificate programme.

As regards the dyestuff industry, Mr. Bhatia noted that some of the industry's demands had been taken care of. The demand for concessional excise duty and exemption limit from Rs. 15 lakh to Rs. 30 lakhs had already been met. Proforma Credit for exports unutilized in the Small Scale Sector was also given.

Mr. Bhatia gave an assurance to the members that he would always be available to solve any of their problems.

DMAI AWARDS

1. JAY CHEMICAL INDUSTRIES :
Winners of 1st Award. Certificate of Merit for Exports in the SSI Sector for 1986-87. Exports worth about Rs. 3 crores.

2. VIVID EXPORTS, VAPI :
Award for exports of dye intermediates in the SSI Sector — Certificate of Merit for 1986-87. Exports worth about Rs. 1 crores. For the current year exports worth about Rs. 3.5 crores.

3. COLOUR CHEM LTD. :
Certificate of Merit for exports of dyestuffs in the large scale sector for 1986-87. Exports worth about Rs. 9.39 crores. (12.5% of its turnover).

4. COLOUR CHEM LTD. :
Certificate of Merit for export of dyes intermediates in the large scale sector.

AWARDS

1. JAI CHEMICALS INDUSTRIES :
Export dyes in the SSI sector for the year 1986-87.

2. METROCHEM INDUSTRIES :
Export dye intermediates in the SSI sector for 1986-87.

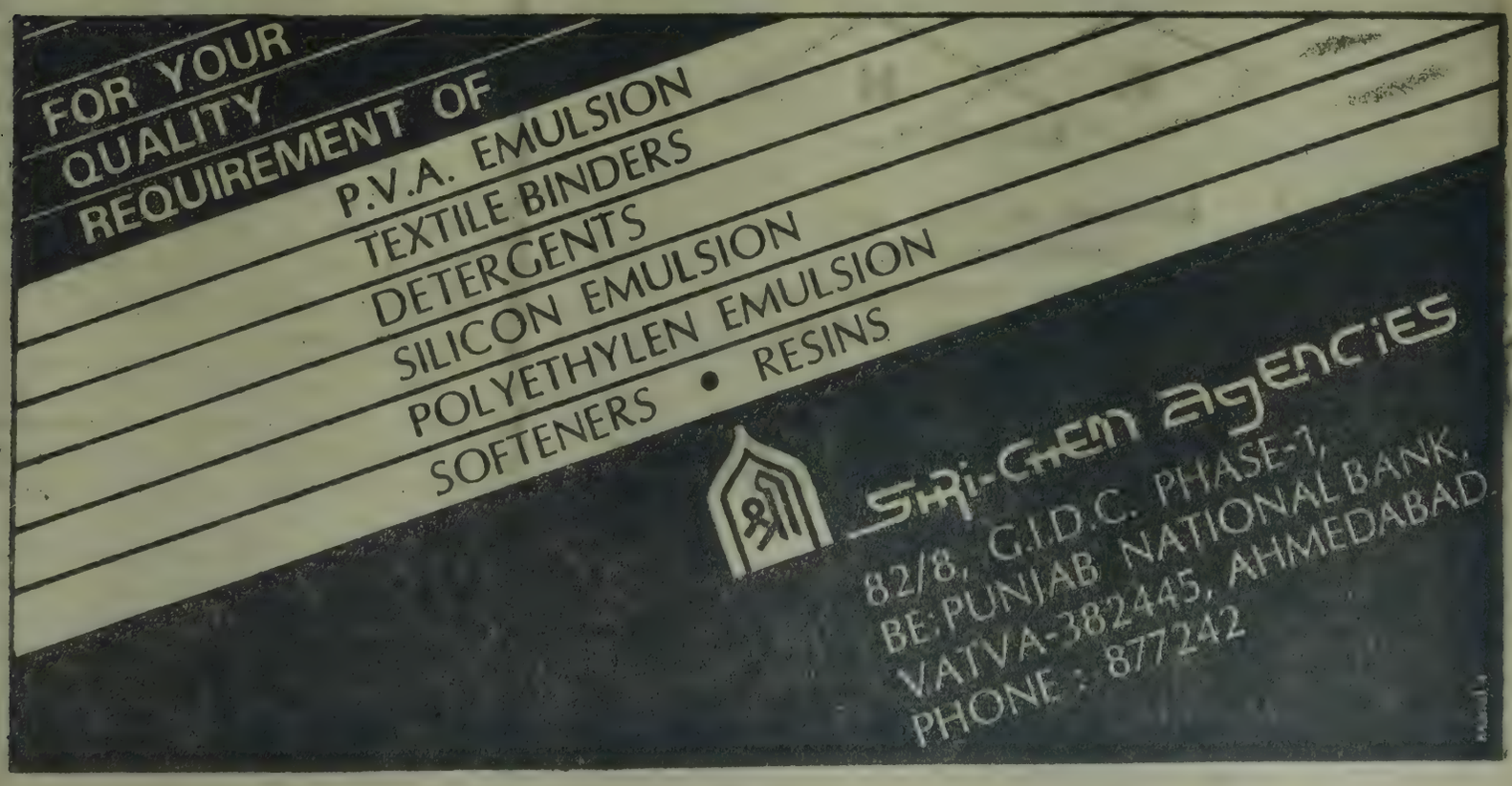
3. IDI LTD. :
Export of dyes 1986-87 in the large scale sector. Exports worth about Rs. 22 Crores.

4. IDI LTD. :
Export of dye intermediates in the large scale sector.

5. VIVID EXPORTS :
Merchant Exports of dyes & dye intermediates.

6. ARLABS LTD. :
Special Award for Export of new indigenous technology in dye intermediates.

7. ARLABS LTD. :
Introduction of new product in international market.



(Contd. from p. 47)

on agrowastes and biomass gasification-fluid bed combustion-coal gasification and combined cycle operation-MHD power generation-alcohol as a fuel for I.C. engines-methanol and its potential-recent development in photovoltaics and their promise-solar thermal systems-social forestry and its promised impact-windmill farms-suggested optimal energy input packages region-wise for industry's requirements.

5. Steam Generation and Distribution: V. Raghuraman

Steam is the major source for meeting process heat in chemical industries. The chemical industries also lend scope for optimising heat and power loads through incorporation of co-generation systems, heat exchange networking and energy analysis. Choice of boilers for meeting and changing heat power requirements influences the energy consumption. Further, the efficient steam distribution systems by way of proper sizing of pipelines, inevitability of reducing valves, steam traps, condensate recovery and flash recovery are important parameters which merit attention.

6. Power Generation and Distribution: K. T. U. Malliah

All aspects of power generation and distributors are discovered from the point of maximum utilisation of the energy produced.

7. Design of Equipment For Energy Economy: R. V. Ramani

Selection of equipment-material of construction — simplicity. Energy consumption — labour safety factor — efficiency of operation — reliability — averting down time — inventory of spares — their availability at short notice — operation, erection and housing needs.

8. Feed Water Quality, Condensate and Waste Heat Recovery: T. R. Viswanathan

Importance of boiler feed water quality to improve energy efficiency by preventing deposits and corrosion, and minimising blowdown — treatment methods for raw water — pretreatment to reduce dissolved gases — organic matter, microorganisms, colloidal silica and iron, and suspended solids—demonstration to bring down dissolved to very low levels—return condensate treatment methods—deaerators — pH control-dosing chemicals for corrosion and deposit control in the boiler, and feed water and steam lines — waste heat recovery systems.

9. Operation of Chemical Plants to Reduce Energy Consumption : R. V. Ramani

Different types of energy involved — new conversions — equipments selection mode of operation — multipurposes — energy balance — recovery of waste — maintenance angle — personnel angle — value engineering— overall energy efficiency concept.

10. High Temperature Insulation : Dr. T. S. Kannan

This paper is intended to present the state-of-the art on the preparation, properties and applications of various fibrous ceramic materials which are being used as thermal insulators for a variety of application.

11. Synthetic Liquid Fuels: R. Vaidyeswaran

The various processes for obtaining synthetic liquid fuels from coal are reviewed particularly for getting middle distillates and the country requires more of these middle distillates than gasoline and there is a shortage of these.

12. Hydrogen Economy: H. V. K. Udupa

In the manufacture of caustic soda and chlorine by the electrolysis of brine, hydrogen is a bye-product. There are other processes in industry where it is available as a by-product. Studies relating to alternate sources of energy indicate that electricity will be the form in which energy will be available in future. The 'electrical age' also envisages use of hydrogen as a fuel. It is proposed to discuss the hydrogen economy of the future from all these points of view, highlighting manufacture of hydrogen and use of hydrogen with the related advantages.

PLASTICS EXPORT PANEL TO VISIT W. ASIA

The Plastics and Linoleums Export Promotion Council has sponsored a three-member sales mission to Saudi Arabia and other countries in West Asia.

The team, which leaves in Bombay on March 29, will visit, apart from Saudi Arabia, Bahrain, Kuwait, Qatar, Sultanate of Oman and the UAE, to discuss expansion of trade relations in the field of plastic and soft luggage, according to a press release issued by the council.

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Gas reserve outlook bright

The development of natural gas industry would play a vital role in the country's economy in the years ahead, according to Mr. Brahm Dutt, Union minister for petroleum and natural gas.

Mr. Dutt, whose speech was read out in his absence at a function organised by the Forum of Asian Managers on the occasion of the first K. D. Malaviya memorial lecture, said that the future reserve outlook for gas appeared to be quite optimistic.

Thus a large programme for optimum utilisation of gas is being envisaged by the government for the next 5 to 10 years.

This would mean that there would be a progressive increase in the share of gas in the country's hydrocarbon consumption mix, Mr. Dutt said. However efforts are needed for optimum utilisation of natural gas.

He said that if the country is able to stretch its oil output to around 40 to 45 million tonnes by the middle of next decade and around 50 to 55 million tonnes by the turn of the century and with various measures of oil conservation, demand management etc. it might be possible to contain the imports around 30 to 40 million tonnes by 1995-2000.

Currently India's oil consumption is growing at the rate of about 7 per cent per annum. If the country is able to bring down this rate over the next decade to around 5 per cent, the savings in the country's oil imports at current prices could work out to about Rs. 11,000 crores.

In terms of mid-1990s prices, these savings might be still larger. This called for a greater emphasis on conservation and management of oil demand through a combination of fiscal, technological and other measures to regulate the oil demand. It also called for acceleration of exploratory and development efforts for hydrocarbons.

Oil is the fall-back source of energy to meet the shortfalls in the core energy sectors. This role is likely to continue in the future as well. The oil industry therefore would need to gear up and expand its infrastructural facilities.

Mr. Dutt said that oil industry in India today is a well run and most profitable segment of public sector and this sector owes its success to the oil policies and programmes enunciated and followed by the late Mr. K. D. Malaviya.

Mr. Lovraj Kumar, former secretary (petroleum), delivering the memorial lecture, said that technological systems and processing technologies that are available to Indian oil industry from other countries do not and cannot lead to solutions that are optimal to the country.

If India has to search for optimal solutions to our problems the country should traverse the path of scientific and technological innovation.

There has to be a clear recognition that this is indeed the aim and that too not for the distant future. With the in-house R and D centres that have been established in the oil industry this should be achieved rapidly.

Mr. Kumar said "It is my hope that soon we shall not purchase technology packages from over seas and instead buy such processes and components of technological systems as appear attractive, test these in pilot plants and projects within the country and ourselves design and build plants that are for our raw materials and operating conditions."

OIL INDIA'S PROJECT IN RAJASTHAN

The public sector Oil India, which had hitherto concentrated its operations mainly in the north east, is going out in a big way to explore the desert sands of Rajasthan.

With a budget of Rs. 51 crores for the remaining two years of the Seventh Plan, Oil India is stated to drill six exploratory wells covering a total of 26,000 metres, during the period.

According to Oil India sources, the first exploratory well of Rajasthan project near Tanot in Jaisalmer district has been spudded and it is targeted to reach a depth of 3,500 metres. The well is closed to the Indo-Pakistan border and Oil India has constructed a 25 km approach road to facilitate movement during drilling.

The foreign exchange component of Oil India's Rajasthan project is being funded by a World Bank loan. The tentative allocation for this project is $25 million.

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Oil struck off AP coast

Oil and gas has been struck by ONGC in a well located about 4.5 kms from the coast in Krishna-Godavari offshore and at a distance of about 25 kms south-east from Amalapuram town in west Godavari district of Andhra Pradesh.

The well, drilled down to a depth of 3,120 metres, is producing 5,000 barrels of oil and 1.6 lakh cubic metres of gas per day, according to an ONGC release.

The prolific production rate of this well has further enhanced the potential of the GS-16 structure in which the other three wells drilled on this structure have proved to be oil and gas bearing. Nine additional wells are to be drilled.

The Krishna-Godavaris basin encompases an area of 20,000 sq. kms on land and 21,000 sq kms in the offshore. The resources are estimated to be 760 mmt of oil and oil equivalent of gas (275 mmt for the onland and 485 mmt for the offshore).

Geoscientific surveys in the Krishna-Godavari basin were started in 1959 and geological, gravity magnetic and seismic surveys were conducted to locate prospects. Common depth plan (CDP) surveys on both onshore and offshore surveys were conducted in shallow waters and several prospects were identified.

Sustained exploratory efforts by ONGC have led to the identification of several other prospective areas in KG basin. Offshore, oil and gas has been struck at G-1 and G-2, , besides GS-16 structure.

ONGC plans to give a bigger thrust in this basin by increasing the number of rigs. Presently, eight rigs are operating in onshore and offshore. It is proposed to add seven more rigs by the end of Seventh Plan.

In the next two years, the Krishna-Godavari basin would be developed to supply three million cubic metres of gas to various users in the region.

The Seventh Plan programme of Krishna-Godavari basin includes completion of 46 wells (36 onland and 10 offshore) and seismic surveys. Approximately Rs. 447 crores is expected to be spent on Krishna-Godavari exploration efforts during seventh plan by ONGC.

SUBSIDY FOR IDPL RECOMMENDED

The Committee on Public Undertakings (PUC) of Parliament has recomended that the Government should favourably consider the feasibility of subsidising Indian Drugs and Pharmaceuticals Ltd. (IDPL) on the analogy of fertiliser units, which help increasing agricultural output.

In its report presented to Parliament on March 29, the committee has opined that there is a strong case for providing subsidy to IDPL as it supplied life saving drugs at a price lower than the cost of production to countrymen and helps them maintaining their good health.

The committee is not convinced by the reply of the Government that due to financial constraints it could not subsidise IDPL on the analogy of fertiliser units. The committee feels that the Government has not given a serious thought to the suggestion of subsidising IDPL.

The committee reiterates its original recommendations and has desired that the Government should consider the matter in all its seriousness.

The committee says that the financial constraint should not come in the way of subsidising IDPL if it is expected to supply life saving drugs at a price lower than its cost of production.

The committee has observed that many of the small-scale units were thriving on the technology stolen from IDPL either through the retired persons or through those who were inside the company and were acting as black sheep.

The committee recommended that to protect the interest of IDPL and to provide protection against the theft of their R and D efforts, the Government should consider the feasibility bringing in a comprehensive legislation to eliminate the chances of leakage of technology.

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Environment cess on coal mooted

The Bureau of Industrial Costs and Prices which scrutinised the state of affairs of the coal industry last year has recommended that the Government should levy an environment protection cess of one per cent on the average pithead price of Rs. 210 per tonne to be operated by the Department of Coal.

It has further suggested that the funds out of this account should be disbursed to Coal India during a financial year for environmental protection measures. The expenses actually incurred on such schemes may be monitored at regular intervals, preferably every quarter.

For this purpose the Department of Coal may consider forming a standing committee of directors involving other relevant agencies on Central and State Governments, like pollution control boards, department of forest etc.

The BICP is of the view that as the programme picks up, the level of environmental protection cess may be suitably increased from the presently proposed level of 1 per cent on the average pithead price.

The bureau has noted that present experience of the developed countries, for example, the US suggests that in future, environment protection is likely to emerge as a major cost centre in the coal industry.

In addition to the problems of environmental control, management and preservation for the coal companies, there is the need to keep in view the increasing problems of waste disposal in many of the coal consuming industries, especially in power stations.

The BICP has pointed out that this problem also calls for major investments on the part of these consumers in equipment like electrostatic precipitators for collection of this ash and to keep the dust levels at acceptable limits.

The Minerals and Mining Regulation and Development Act, 1957, empowers the Union Government to frame rules related to land use and water pollution. Presently, no comprehensive law exists for the protection of the environment arising from strip mining and deep caving from underground mining. The BICP has said that with more and more awareness about environment an vast expansion in mining activities, the need by coal companies to control pollution would be made obligatory. Apart from pollution control, measures should be taken for land reclamation.

COAL PRODUCTION TARGET EXCEEDED

Coal production during 1987-88 exceeded its 158 million tonnes target by one million tonnes according to Coal India Ltd. (CIL) sources in Calcutta.

Coal production rose to 159.06 million tonnes compared to the previous year's production of 144.77 million tonnes, registering a growth of 9.9 per cent.

This was for the third successive year that coal production in the mines under CIL exceeded the target. The sources said that CIL during the first three years of the Seventh Plan had surpassed the target meant for each year. The increase of 14.29 million tonnes during the last financial year was the highest-ever growth recorded by CIL in any single year.

The CIL sources said that its mines could exceed their targets for the year despite six day's strike during the peak production period last month. All the subsidiaries of CIL achieved their respective targeted production assigned to them.

The Madhya Pradesh-based South Eastern Coalfields contributed the highest production with 39.95 million tonnes, followed by ECL 28.04 million tonnes, CCL 27.30 million tonnes and BCCL 25.10 million tonnes. The contribution of Western Coalfields was 21.20 million tonnes, Northern Coalfields 16.50 million tonnes and North Eastern Coalfields 0.97 million tonnes during the year.

The sources further said the CIL share in the country's total coal production was around 90 per cent. The organisation was able to achieve the consumer demand satisfaction to the tune of 93.5 per cent by despatching 153.33 million tonnes during the last financial year. The despatch of coal to the consumers in the previous year was 141.7 million tonnes — a growth of 8.2 per cent.

The demand fulfilment for the power sector, the organisation's largest consuming area, was 101.5 per cent.

Sudarshan Chemical's treatment plant

Sudarshan Chemical Industries Ltd (SCIL) with plants in Pune and at Roha, in Raigad district, about 140 kms. from Pune has finalised a collaboration agreemant with the US firm of Radian Corporation in Texas for setting up comprehensive environmental engineering facilities at Roha.

The plant, estimated to cost Rs. 3 crores, will treat waste water, solid wastes, atmospheric pollutants etc. It would be ready by 1990.

Radian Corporation is the world leader in waste management and risk analysis and their business is booming particularly after the Bhopal tragedy. The accident could happen as there was no risk management at the Union Carbide's plant at Bhopal at the time the accident occurred, according to Dr. R. J. Rathi, chairman and managing director of SCIL, who met pressmen recently at Roha.

The SCIL will be sending ten drums of waste matter collected at Roha plant to Radian Corp. where it will be analysed and a plan drawn up for their treatment.

The SCIL was started in small garage in Pune in 1952 with a capital of Rs. 40,000 and produced chrome yellow pigments and gradually added other varieties to its product range. By 1962, the SCIL was producing a wide range of organic and inorganic pigments. It later diversified into the field of intermediates which are required as base raw materials for organic pigments. In 1967, the SCIL acquired nearly three hectares of land in another part of Pune. But its growth was so phenomenal that the management acquired 36 hectares of land in MIDC area in 1977 where it is manufacturing a number of intermediates, pigments and pesticides.

In 1981, the SCIL's research and development dept. with the help of the Regional Research Laboratories of Hyderabad and Jorhat, diversified into the manufacture of technical grades of pesticides, which were imported till then or were the monopoly of multinationals. The SCIL formulated its technical grades of pesticides for the benefit of the farmers and launched Sufos, Sumidon etc. It also added a weedicide, Butachlor technical grade and its formulation, which is developed by SCIL's R and D.

The SCIL has been exporting pigments since early sixties to advanced countries in Europe and U.S. The SCIL's exports in 1988 totalled Rs. 7 crores to over 40 countries.

ROCKETRY, SPACE PROJECTS FOR BIT SANCTIONED

The Centre has sanctioned special projects in rocketry, space engineering and pharmaceutical sciences for the Birla Institute of Technology (BIT) at Mesra, near Ranchi.

Official sources in Ranchi on April 2, said the Institute has successfully developed fuels for solid propellant rockets and has set up a research facility in hybrid and liquid propellant technology.

Several projects have been undertaken for the Ministry of Defence, Atomic Energy Commission, ICAR and new R and D schemes. Flame propagation and stability unit has been installed to study the combustion behaviours, flammability limits and flame propagation velocity of gaseous fuels.

A course in Plasma Engineering Science at the post-graduate level is on the anvil and a basic Plasma laboratory has been set up.

Apart from a computer centre, a micro-processor development centre was established in 1982 83.

In pharmaceutical sciences, extensive research in aromatic and medicinal plants has been undertaken and research facilities are available at the Institute.

TECHNOLOGY FEE HIKE DENIED

Government denied in the Lok Sabha reports that, Snam Progetti, an Italian firm, was raising the technology fee for each successive fertiliser plant based on its design.

The Minister of State for Fertilisers, R. Prabhu, told Mr. Indrajit Gupta, in a written reply that the fees were not comparable due to difference in the scope of work entrusted to the firm in successive projects.

Replying to another question, the Minister said that the Indo-Gulf Fertiliser and Chemicals Corporation Ltd. had sought to double the capacity of its gas-based fertiliser plants at Jagdishpur.

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Govt. urged to withdraw fert. discount

Mr. Rohit C Mehta, President-elect of the Federation of Indian Chambers of Commerce and Industry, has urged the Government to withdraw its decision making the fertiliser industry to give discount of 7.5 per cent as the conditions have undergone a change.

Mr. Mehta, who is also Chairman of the Gujarat Narmada Fertiliser in an interview regarding the problems faced by the fertiliser industry, said the discount will 'seriously' erode the profitability of all fertiliser units as the Government expects the industry to absorb this discount.

He said, on the advice of the Government, public sector fertiliser units have already announced the discount but the private sector is still awaiting official instructions from the Government. He said the discount is announced on the assumption that the fertiliser units are any way giving large discounts and there will be no adverse effect on them.

Mr. Mehta said the industry, which is saddled with huge inventories due to the unprecedented glut situation, is forced to give discounts to tide over the liquidity crisis. With the stoppage of imports and hopefully with good monsoons, it is felt that the supply-demand balance will slowly be restored and discounts eased out. Also if the consumption pattern of fertilisers in the country is considered, the reduction in fertiliser prices does not seem to have much effect on increase in their consumption.

Therefore, the fertiliser industry will have to continue to bear the inventory cost to the extent of unsold quantities of fertilisers and in addition, they will have to absorb the 7.5 per cent discount announced by the Government.

Mr. Mehta pointed out that the prices of fertilisers are fixed by the Government under the fertiliser control order but it is not known how the Government can ask the industry to offer discount without a statutory notification.

However, as all public sector fertiliser units have already offered the discount, the fertiliser units will have to follow suit if they want to sell the fertilisers as per the allocations made to them under the fertiliser control order.

He said although the Minister of Fertiliser has recently announced that the Government is considering the inventory cost, nothing has so far been decided. "But we are sure the Government will come out with some solution as they do not want the industry to cut down the production and at the same time do not want the industry to sell beyond allocations made under the Essential Commodities Act, which is 60 per cent of the production of fertiliser units, Mr. Mehta said.

He said it is expected that the Government will compensate industry by way of decreasing the prices of inputs, such as naphtha, oil and gas, which again are controlled by it. He said though the country produces less than what it consumes there is a situation of glut due to several factors. These include increased availability of indigenous fertilisers, projected demands not materialising because of drought conditions for three successive years and excessive import of fertilisers since 1984-85. One contributing factor for non-materialising of projected consumption is incorrect estimates of demand, he said.

Mr. Mehta said the total stock of nutrients increased from 2.5 million tonnes at the start of 1985 to 4.3 million tonnes by April, 1987. This situation of unprecedented glut sparked off a fierce price war. Heavy discounts and rebates were offered eroding the profitability of the industry. He said it is reported that about Rs. 400 crores were spent in 1986-87 on discounts and rebates alone.

He said it is crucial that the industry is enabled to tide over the current crisis or it would take a long time to recover. The Government has a crucial role to play at this juncture. Some of the steps that can be taken include devising a system of estimating demand projections on a realistic basis, a total embargo on imports immediately and restoring imports to the traditional role of residuary character.

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He said there is need for payment of inventory carrying cost of imported fertilisers and releasing them only when there is a deficit. In other words, a buffer on imported fertilisers on the analogy of the foodgrain buffers should be created. Besides there should be immediate payment of inventory carrying cost of indigenous fertilisers which are not allocated for sale.

He stressed the need for a thorough re-examination of the Essential Commodities Act allocations to take into account the twin objectives of meeting the demand for fertilisers in a particular State and legitimate aspirations and capacities of fertiliser companies to market their products.

Mr. Mehta said the only long-term solution for the survival and growth of the fertiliser industry lies in increasing fertiliser consumption to a level of 20 million tonnes by 2,000 AD so as to produce the 240 tonnes of foodgrains that would be required to support the 1,000 million population of the country.

The first and foremost task is to ensure that fertilisers are available. The price of imported fertilisers is governed by the supply-demand equation.

CALL TO ENSURE EASY AVAILABILITY OF FERTILISERS

The Minister of State for Fertilisers, Mr. R. Prabhu, has asked the fertiliser industry to stock adequate quantities of fertilisers in consumption areas to ensure easy availability of this critical input to the farmers ahead of the cropping season.

At a meeting of the chief executives of public, co-operative and private sector units convened specially to ensure adequate availability of fertilisers at discounted prices, Mr. Prabhu said that this will motivate the farmers to increase agricultural production and achieve the target of 166 million tonnes during 1988-89.

The Minister asked the industry to maintain price discipline and ensure that the entire benefit of the recently announced 7.5 per cent discount is passed on to the farmers who should get urea at Rs. 108.70 per bag of 50 kg plus local taxes, wherever applicable.

Mr. Prabhu cautioned that stringent action would be taken against defaulters in case the entire discount is not passed on to the farmers.

RS. 30-CRORE CANADIAN AID FOR FERT. PROJECTS

India and Canada on March 30, signed a memorandum of understanding under which the Canadian International Development Agency will provide a grant of 30 6 million Canadian dollars (Rs. 30.25 crores) for fertiliser (potash) projects. The Finance Secretary, Mr. S. Venkitaramanan, and the Canadian High Commissioner, Mr. James G. Harris, signed the memorandum of understanding.

Under the agreement, Canada will provide assistance in the form of muriate of potash and technical expertise.

Funds generated from the sale of the muriate will be utilised to support extension activities in Barabanki, Meerut and Sultanpur districts of Uttar Pradesh.

The main focus will be on the increased and balanced use of fertilisers, including potash. In addition, soil testing, plant protection, use of improved seeds, water management and field activity training will be covered, an official release in New Delhi.

REFINERY CAPACITY

The capacities of the Mathura and Koyali refineries are being increased to 7.5 metric tonnes per annum and 9.5 mtpa respectively.

Mr. Rafiq Alam said in a written reply that the expansion of the Mathura refinery will cost about Rs. 5.5 crores and will be completed by July next. The expansion cost of the Koyali refinery, which will also be completed by July, is Rs. 27.62 crores.

To another question, Mr. Alam said that during 1988-89, 18.06 million tonnes of crude will be imported.

He told another member that up to July 17, ONGC had established geological reserves of about 13.20 million tonnes of oil and about 12,870 million cubic metres of natural gas in onland and offshore areas of the Krishna-Godavari basins.

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MRL AROMATICS COMPLEX CO-PROMOTER

Reliance, JK group, SPIC shortlisted

SPIC, the JK group and Reliance Industries have been shortlisted by Madras Refineries Ltd. (MRL) for selection as a co-promoter for the Rs. 840-crore aromatics complex proposed to be set at Manali. The three have been panelled from among a field of over 10 firms which entered the fray.

The Centre will make the final choice after vetting the claims of these three, besides processing the parallel proposal of a tie-up between IPCL and MRL. The decision is expected in four to six weeks' time from now.

Disclosing this at a press conference in Madras the MRL Chairman and Managing Director, Mr. V.R. Deenadayalu, said that the ability to mobilise finances and the technical knowhow has governed the process of shortlisting. He was replying to a volley of questions on who figure in the list.

Reliance, it may be recalled, was the last to enter the race for the co-promoter stakes, while IPCL's case has been dealt with on a different footing.

Explaining the parallel proposal for a link-up between IPCL and MRL, Mr. Deenadayalu said the Centre has before it two different sets of details on the dynamics of a tie-up. The details have been submitted separately by these two companies.

IPCL, according to him, has been advocating a bifurcation of the proposed aromatics complex on techno-economic lines. In the event this proposition is accepted, MRL's participation will be limited to the production of xylenes and the setting up of the necessary plant and infrastructure, while IPCL will take charge of the PTA segment of the aromatics complex.

IPCL's reasoning is that the production of xylenes will be a logical corollary to MRL's present activities and tested abilities.

Mr. Deenadayalu, conceding that IPCL is a financially sound company with high technical credentials as a leader in the petrochemical industry, said IPCL has therefore staked its exclusive claims to manage the proposed PTA unit.

At the same time, he pointed out, MRL has submitted the proposition that it could be allowed to co-sponsor the aromatics complex with IPCL on a basis of "equal participation", with no bifurcation of the project.

Answering a question, the MRL Chairman said the ball is now squarely in the Centre's court, with IPCL and the three other co-promoter aspirants constituting the final field of choice.

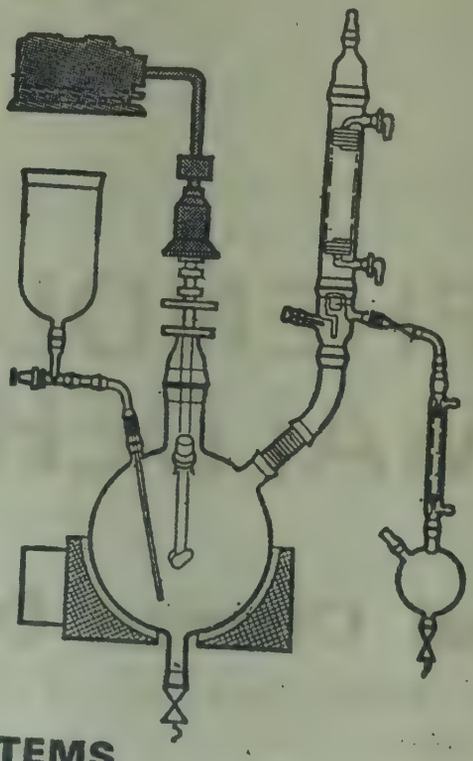
Only after the co-promoter is selected, the finer project details such as the necessary foreign technical know-how etc, will be clinched. For its part, MRL has so far done some meaningful windowshopping abroad for the knowhow package, he explained further.

As for MRL's more immediate projects, he said a letter of intent has been obtained for a lube additives plant of 15,000-tonne annual capacity. A preliminary understanding has been reached with Chevron Chemical Co. in the US. A four-member delegation recently visited the US for this purpose and the technical contract, if finalised, may entail an expenditure of the order of $ 15 million.

The additives plant, designed to produce speciality chemicals such as ashless dispersants and metallic detergents, may cost Rs. 25 crores. The feasibility of setting up the unit as a joint venture between MRL and the prospective foreign collaborator is also under consideration. The two may also participate in the equity in the ratio of 3 :2, he added.

As the Rs. 130-crore project for the expansion of the existing facilities for producing lubricants has not yet been cleared, MRL has no immediate plans to issue new bonds. For the present, he said the other and relatively less expensive projects on the anvil could be financed through internal resources or aid from Oil Consultative Committee and the Oil Industry Development Board, he explained.

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Further, MRL has not yet fully tapped the prospects for public deposits fully. Against a permissible target of Rs. 57 crores, it has so far mobilised only Rs. 41 crores.

Turning to the Rs. 13.80-crore propylene project, now under construction, Mr. Deenadayalu said trial production will start after the mechanical erection is completed by July-August this year. Till the prospective and Madras-based downstream units are ready, the propylene will be sold in Gujarat and Maharashtra, he added.

Asked about MRL's findings on the quality of crude supplied to it from the Cauvery basin, the Chairman said R and D studies have been carried out on the small quantities supplied to it.

A tentative proposal has been blueprinted for setting up a mini-refinery, should the Cauvery discoveries hold out the prospects for a minimum supply of at least 10,000 barrels a day to MRL. In the event, the mini-refinery could be set up at a capital cost of Rs. 70-80 crores, with an installed capacity to process a crude throughput of 0.50 million tonnes a year. The mini-refinery could be set up either under MRL's own wings or MRL could perhaps sponsor it near the oilfields, he indicated, without at all committing himself on this.

To the question whether there are any prospects for setting up a naphtha cracker complex under the MRL auspices, Mr. Deenadayalu explained that the company's current projections leave little or no scope for immediate plans to go in for a cracker complex.

Of the nine lakh tonnes of naphtha which MRL churns out every year as it were, 2.20 lakh tonnes is committed to Madras Fertilisers Ltd. Much of the remainder naphtha is now being exported. When the aromatics complex is set up, about 3.50 lakh tonnes of naphtha would be consumed by it as a feedstock.

In the event, the residual naphtha would be inadequate to set up a cracker unit. This is so, mainly because a cracker unit of the smallest economic size will require at least 0.50 million tonnes of naphtha. MRL does not at present have surplus naphtha of this order.

Secondly, and no less significantly, the naphtha obtained from the Bombay High crude processed at MRL is technically an ideal feedstock for extracting aromatics. Hence, in the first place, MRL proposed an aromatics complex, instead of a cracker unit.

Yet, Mr. Deenadayalu hastened to add, a cracker could still be thought of in Madras itself when the MRL crude throughput capacity is expanded considerably from the existing level, or if more naphtha becomes available in the southern region from other refineries.

As for the short-term perspective, MRL increasingly use all the surplus naphtha at its disposal for producing petrol and related products, he added.

Giving an overview of the company's performance in the fiscal year ended recently, he said the crude throughput was of the order of 5.13 million tonnes, compared to 5.19 million tonnes in the previous year. The profit before tax amounted to Rs. 30.03 crores in the year under review, as against Rs. 28.45 crores in 1986-87. The net profit in 1987-88 will be Rs. 25.33 crores.

Other highlights of the year under review: LPG production. 1.13 lakh tonnes (a new record) petrol output 2.14 lakh tonnes (another peak): sales turnover: Rs. 1195 crores: contribution to Central and State exchequers, Rs. 769.27 crores and fuel and loss, 0.371 million tonnes.

Mr. Deenadayalu said a Rs. 4 crore project to recover part of the gases being flared will be commissioned by the end of 1988, entailing a saving of the order of Rs. 2.30 crores per year.

Modernisation of the instrumentation system in the first refinery will be completed by May 1989, at a cost of Rs. 19.62 crores, while a Rs. 8.80-crore project to produce 25,000 tonnes of foodgrade hexane every year, as also a Rs. 19.50-crore project to treat sewage water for use by MRL, have been sanctioned for inclusion in the Seventh Plan itself.

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FOREX FOR PETROCHEM PROJECTS:

World bank funds sought

India is seeking World Bank assistance in a big way to meet the foreign exchange requirement of a number of petrochemical projects in the pipeline. Assistance to the tune of $150 million is also being sought for import of polymers next year.

A World Bank team, according to competent sources, is already here for discussions and evaluation of petrochemical products.

Indications are that the World Bank has consented to meet the foreign exchange needs of the Maharashtra Gas Cracker Complex (MGCC) expansion plans. The MGCC project, being implemented by the Indian Petrochemicals Limited (IPCL), has a capacity of 3 lakh tonnes of ethylene which is proposed to be raised to four lakh tonnes.

Apart from providing funds to MGCC, the bank team is believed to be inclined to meet the foreign exchange requirements of the Gujarat gas cracker complex to be set up by Reliance Industries. This project was approved recently by the high-power Projects Approval Board (PAB) headed by the industry secretary. Having obtained PAB clearance, Reliance Industries is now taking steps to tie up credit for this project, which is likely to cost Rs. 1500 crores. This is inclusive of the cost of downstream units which will produce HDPE, LDPE, PVC and MEG. The total foreign exchange requirements of this project are estimated at Rs. 300 crores.

The Gujarat gas cracker project may be set up much quicker than anticipated, judging by the speed with which clearances have been obtained from various authorities.

In fact, it appears that Reliance Industries will be able to tie up its foreign exchange requirement for the Gujarat project during the current visit of the World Bank team.

The government is also hopeful that before the team returns, an understanding would be reached regarding import of polymers for next year. Demand for these petrochemical products has risen rapidly, much beyond official expectations in the last few years. The total foreign exchange requirement for polymers imports is presently estimated at about $ 400 million next year, of which the World Bank may be able to provide up to $ 150 million. The official estimates of imports may, however, have to be revised in view of rising prices of plastics in world markets.

Meanwhile, uncertainty surrounds the fate of the Rs. 1,500-crores Haldia petrochemicals project being set up jointly by the West Bengal government and Mr. R. P. Goenka. Notwithstanding official assertions that all clearances have been given, enquiries from West Bengal government sources reveal that even the letter of intent for this project had expired by the end of December last year. When contacted, industry ministry sources said the letter of intent is "being renewed."

Besides, three of the foreign collaboration approvals have expired, while another three applications for foreign collaboration are pending consideration by the government now for almost a year.

It is, thus, paradoxical that while on the one hand the government professes to be anxious to set up additional petrochemical production capacities to meet growing demand, inordinate delays are being encountered in setting up plants for which the clearances, in principle, have already been given. Haldia is a classic case. It is already behind schedule by three years. In case projects continue to be delayed like this, experts maintain that polymers' shortages are likely to flare up in the coming years which may force the authorities to resort to larger imports.

The problem may get further compounded because international prices of all major plastics, particularly LDPE, HDPE, PP and PVC, are rising rapidly. These products are not easily available. Ethylene is in short supply the world over. According to experts, any disruption in supplies to this country would cause widespread harm to a large number of plastic manufacturers in the small-scale sector.

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ONGC may exceed target

The mid-term review undertaken by the Oil and Natural Gas Commission has revealed that it is likely to exceed the Seventh Plan production targets.

The target of 40.1 million tonnes of oil and oil equivalent of gas is expected to be met by the end of the Seventh Plan. The gas utilisation percentage which stood at 63 per cent in 1984-85 increased to 76 per cent by the mid-term of the Seventh Plan.

A feature of the current Plan has been a build-up in the geological reserves. As against a target of 970 million tonnes, reserve accretion during the Plan period, already 508.9 million tonnes of oil and oil equivalent of gas (52.5 per cent achievement) has been added. The geological reserves on a cumulative basis as on July 1987 stood at 4160.33 million tonnes. The reserve build-up is a reflection of the intensification of exploratory activity during the current Plan period.

Possessing an enviable record of financial performance, with equity remaining at Rs. 342.85 crores since 1981, the funds for development and growth have been primarily met through internally generated resources and commercial borrowing in foreign currency. In 1985-86 as against the revised estimate of Rs. 1,934 crores the total internal resources amounted to Rs. 1,950 crores. During 1986-87, as against a revised estimate of Rs. 1,837 crores, ONGC's actual internal resource generation was Rs. 1,905 crores. This amount was sufficient in meeting 86 per cent of the Plan expenditure for 1986-87. On the basis of ONGC's performance during 1985-87 and projections for the next three years, the generation of internal resources (excluding borrowings) for the Seventh Plan would be Rs. 10,970 crores which is higher than the target of Rs. 10,773 crores.

With a view to integrating the development of the offshore/onshore gas resources and markets in Western parts of the country, the Western India Gas Development Project has been identified by ONGC to be financed partly by the World Bank. The scope of phase II development of South Bassein field, gas sweetening facilities at Hazira phase II, gas component of Heera field development phase II, mid and South Tapti field developments and the development of Gandhar and Dahej fields.

The World Bank has agreed to finance a part of the total project cost of Rs. 1,550 crores to the extent of $295 millions (Rs. 383.5 crores). ONGC is now implementing three projects under World Bank assistance. They are Krishna-Godavari project, South Bassein project and the Cambay Basin petroleum project.

IPCL CHIEF RESIGNS

Dr. Subroto Ganguly, chairman and managing director of the public-sector Indian Petrochemicals Corporation Limited (IPCL) in Baroda has resigned from his position from March 31st.

Dr. Ganguly confirmed that he had sent his resignation letter to the Union government. This has been accepted.

His five-year term as chairman had ended on February 20 and he was continuing in the position "till further orders," the sources said, adding that IPCL finance director S. Bakshi would officiate as chairman and managing director till a new appointment was made.

BID TO MAINTAIN OPEC CRUDE PRICE AT $ 18 A BARREL

The OPEC President, Mr. Rilwanu Lukman, said the price of crude oil is likely to reach the OPEC benchmark of $ 18 per barrel in the next 6 months because of higher northern hemisphere summer gasoline use and the need for restocking low oil inventories, a published report said.

However, he warned that co-operation between OPEC and non-OPEC producers was still needed to support the oil price. It lay in everyone's interest that the two groups 'sit down together as soon as possible and consider how a rational price can be reached quickly,' Mr. Eukman said in an interview with West German journalists in Lagos, Nigeria, reported in the Frankfurter Allgemeine Zeitung on March 26.

A $ 18 crude price was 'rational' because it encouraged investment in new reserves, Mr. Lukman said.

In a remark that suggested OPEC may now also have a desired upper limit for crude prices, Mr. Lukman said at $ 25 per barrel oil was susceptible to competition from other fuels.

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Haldia petrochem prospects dimmer

A big question mark hangs over the giant Rs. 1500-crore joint sector petro-chemical project at Haldia according to a report appearing in **The Indian Post.** While the West Bengal Industrial Development Corporation (WBIDC) and its private sector co-promoter, R.P. Goenka Group of Industries, are determined to go ahead with the project, the third and crucial party to the successful implementation of the scheme, the Centre, is not revealing its mind.

This massive scheme is expected to serve as a much-needed tonic to the ailing industrial sector of West Bengal.

However, the recent raids on the R. P. Goenka Group of Industries have helped little to clear the doubts and only reinforced apprehension about the very fate of the project.

Goenkas, as co-promoters, are to hold 24.99 per cent of the shares in the project, WBIDC 26 per cent and the public 49.01 per cent.

Though all formalities have been completed and the Finance Ministry has shown no grounds to stall it, the Centre's okay has not yet been received. This is despite many meetings with Central Government officials and repeated reminders from the State Government. Coming as it did, the raids on Goenkas left everybody wondering whether the clearance would come through at all.

Chief Minister Jyoti Basu has repeatedly said that if New Delhi has objections to Goenkas' participation, it should say so, so that the State Government could undertake the project on its own. But that would be a tough task for the West Bengal Government. For it cannot easily afford to bear 50 per cent of the burden, even if the other 50 per cent is available from the public. Basu has said that the Centre has so far not communicated any objection to Goenkas and that a raid on an industry does not necessarily mean that it is guilty.

However, there is intense speculation in industry circles in Calcutta, that the delay in clearance and the raids on Goenkas are just intended to scuttle the project. These circles suspect, and so does Jyoti Basu, that the West Bengal project may be dropped in favour of a similar petro-chemical project in Gujarat in which the Ambanis are involved. Interestingly enough Dhirubhai Ambani, has told newsmen a couple of days ago that he was interested in investing in West Bengal. He has been quoted as saying that he was in touch with the West Bengal Government and that he would like to participate in a petro-chemical or any other project in this State. There has been no word on this from the State Government so far.

These circles also mention the name of a Central Minister from West Bengal who is believed to have advised against clearing the project. His argument is that such a massive project would serve to help the image of the Left Front Government and place the Goenkas in an undersirably strong position. The Goenkas will be put in their place if the project is dropped.

Though income-tax officials have seized a large quantity of papers from different offices and residences of the Goenkas, industry sources said nothing incriminating has been identified yet. But Government sources remained tight-lipped. Income-tax officials are said to be concentrating on Philips Carbon Black (PCB) and trying to find out whether this company was enjoying any undue advantage. The PCB supplies carbon black to the Dunlop Tyres, the flagship of the Goenkas.

R. P. Goenka and Sanjiv Goenka, the co-promoters, are still determined to fulfil their commitment. The seven-member board of Haldia Petrochemicals Ltd. held its last meeting on March 21, after the raids. Both the Goenkas asserted that they would go ahead, 'come what may'. The Goenkas have also denied the allegations that they were going in without much financial commitment. R. P. Goenka had said that in such projects, financial commitments of the parties involved were bound to follow certain norms and could not be determined at one's sweet will. The commitment of the Goenkas and their foreign collaborators was to the tune of Rs. 94 crore, he said.

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Considering the failure of the Left Front Government to induce private industrialists to invest in West Bengal, Chief Minister's anxiety to see through the project is quite understandable. In fact, industrialists no longer look upon West Bengal as a problem State and nearly all captains of industry have showered compliments on Basu during the last few years for his Government's changed attitude towards the private sector and the decreasing number of disputes. But only few of them have in fact come forward to invest. Basu has pinned high hopes on the petro-chemical project and naturally gives free vent to his frustrations over its non-clearance.

Haldia Petro-chemical project is to be the largest joint sector project in West Bengal, aimed at revitalising the economy of the State. It has a large employment potential in the downstream conversion units. It will facilitate import substitution of intermediate petrochemical products, have a captive power plant to meet its energy requirements and will be the most energy-efficient petro-chemical plant in the country.

A naphtha-based complex, it is targeted to produce 1,25,000 tonnes of ethylene, 65,300 tonnes of propylene per annum and downstream products based on these. But the project cost is mounting with the delay in its execution. In September 1986 it was estimated to cost Rs. 1,345 crore, but the intervening 18 months have now pushed the cost up to about Rs. 1,500 crore.

The WBIDC received the letter of intent with a capacity of 54,000 tonnes per annum of ethylene and other products in November 1979. The idea was to utilise surplus naphtha likely to become available from the existing and proposed refineries in West Bengal and other States. Subsequently, based on a detailed project report submitted by the WBIDC, the letter of intent was amended in December 1985, to enhance the ethylene capacity to 100,000 TPA, with corresponding increase in the capacity of downstream units. In May 1985, WBIDC and the Goenkas had decided to set up the Haldia Petro-chemicals Ltd to implement the project. The company commissioned Line AG of West Germany, Chemtex Fibres Inc. of the US and Engineers India Ltd to prepare a feasibility report which forms the basis of the project now.

The plant capacity and the downstream product pattern have been reviewed periodically in consultation with the Centre. The future demand of petro-chemical products and the product pattern envisaged in other petro-chemical complexes in the country were kept in view. The product-mix decided upon is: ethylene 125,000 tonnes per annum, propylene 65,300 TPA, high-density polyethylene 81,250 TPA, ethylene oxide/glycol 47,300 TPA, acrylonitrile 58,000 TPA, styrene 37,500 TPA and butadiene 20,700 TPA. The complex would also generate various by-products like gasoline and aromatic extract.

It has been estimated that the project would meet the growing demand for petro-chemical products and that marketing would be no problem. The estimates of demand for each product, made by an expert committee set up by the Central Government, were said to be substantially higher than the conservative estimates made initially.

There is no doubt about its financial viability. In a year of normal activity, the total income from the project would be in the region of around Rs. 542 crore and the operating profit Rs. 210 crore. The return on capital employed works out to 15.98 per cent. The internal rate of return proposed on a plant life of 15 years, would be 17.11 per cent. The interest and amortization of term loans and debentures would be covered adequately by the gross cash accruals, it has been estimated.

ENVIRONMENT PROTECTION MAY BE INCLUDED IN CONCURRENT LIST

The Centre is considering the inclusion of environment protection in the Concurrent List of the Constitution. the Minister of State for Forest and Environment, Mr. Z. R. Ansari said the Rajya Sabha on March 29th.



Baroda plant fire not a major mishap

The damage to the heavy water plant at Baroda is not major and engineers and technicians are working round the clock to put the plant back into operation within two months time, said Mr. S. M. Sundaram, chairman and chief executive in charge of heavy water projects. In April 1986, the Talcher heavy water plant was affected by a fire similar to this one, though that was a major event.

Mr. Sundaram said it could not be compared to the explosion which took place some 10 years ago at this plant. That was a major set-back and took a long time to rectify. The plant was built by a consortium of two French and one Swiss companies. The collaborators bore the entire responsibility for repairing it.

Post haste at the spot :

Mr. Sundaram said after the present explosion experts lost no time in reaching the spot from Bombay. In fact they travelled without ticket on the Rajdhani Express with the permission of the authorities to reach the site as quickly as possible. The explosion occurred at 12-35 p.m. on March 18. They were on the spot by 9-00 p.m.

The Baroda heavy water plant is the only plant which operates at a pressure of 600 atmospheres, since the fertilizer plant to which it is attached is being operated at this pressure. Other plants using this technology operate at much lower synthesis gas pressures, about 200 atmospheres since the fertilizer plants to which they are attached operate at this pressure. For example the two heavy water units at Thal are operating at 200 atmospheres.

Even 15 minutes before the explosion the usual routine check was carried out and everything was found normal. The explosion took place in between two pipelines and it destroyed all cables, lining, etc.

Due for shutdown :

The unit which was producing 45 tonnes annually was shut down periodically. In fact, it was to be shut

The explosion occurred during the lunch interval and the fire lasted for one hour. It was contained during the time. There are automatic devices which would shut off the plant automatically whenever there is any accident. Normally, whenever there is any drop in the pressure, it takes three days for the plant to return to normal pressure. It is a continuous process. Fires in chemical plants are quite common.

Probe set up :

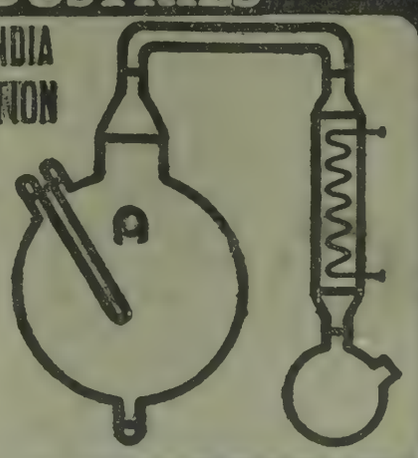
An inquiry commission had been set up under the chairmanship of Mr. Charan Das of the Gujarat State Fertilizer Corporation into the cause of the explosion.

Engineers are taking samples of the carbon steel components to gauge how much damage was caused. There are 500 to 600 samples to be examined. No sabotage is suspected. The life of the plant, which employs 400 people is 20 years. The authorities are confident that it will complete its normal life. Besides Baroda there are plants at Kota, Talcher, Tuticorin, Thal, Hazira (to be commissioned shortly) and Manguru in Andhra Pradesh. Work at Manguru is going to be taken shortly.

Canada is the only other country to produce heavy water. All the other countries producing nuclear power use pressurised tubes. France a major nuclear power, never uses heavy water.

After completing the Baroda plant, Indian scientists developed indigenous technology as knowhow is difficult to obtain since those possessing it are reluctant to part with it. The imported content is only 20 per cent, as getting spare parts from other countries is difficult because vital spares are withheld once it is known that they are intended for heavy water plants.

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India close to buying Soviet 1000 MW reactors

India and the Soviet Union are close to an agreement on the import of two 1,000 MW nuclear reactors.

Dr. M. R. Srinivasan, Chairman, Atomic Energy Commission is expected to finalise the deal with the Soviet Government on the terms for the acquisition of the two VVER-1,000 reactors which may be set up at Koodangulam in Tirunelveli district.

The agreement is expected to be signed by the end of April.

The package involves, apart from the supply of the reactors, the regular supply of enriched uranium fuel. There is no likelihood of any controversy relating to the character of international safeguards in view, presumably, of the arrangement by which the Soviet Union will take back the spent fuel.

The VVER type reactors are similar in design to the pressurised water reactors (PWRs) that are widely used in Europe and the United States. They are distinct from the RMBK Channel-type, light-water cooled, graphite moderated reactors, one of which was involved in the catastrophe at Chernobyl. Although India has been building only the heavy water reactors, and has not taken to designing the pressurised water reactors, engineers in Bombay claim a general familiarity with all aspects of design, operation and maintenance of this type of reactor as well. The boiling water reactor (BWR) units at the Tarapur Atomic Power Station, the country's first nuclear power plant, are only a variation of the PWR, they point out.

There is confidence that the required manpower can be identified and trained in time to operate the imported Soviet reactors.

The Soviet offer was first made in 1979 during the visit of the then Prime Minister, Mr. Morarji Desai to the Soviet Union.

When the discussions took on a serious note some years ago, the Atomic Energy Commission was inclined to consider the smaller 440 MW reactor since units of a larger size would not have been acceptable in any of the regional power grids. Today 500 MW sets have meshed in comfortably with the northern and western region grids, and the Atomic Energy Commission is fairly confident that by the latter half of the 1990s, when the Soviet reactor could become operational, the grids can easily accept the 1,000 MW sets.

It would be interesting to see the final price tag on these reactors. In the many rounds of discussions so far, the Soviet delegates have given no definite cost information, preferring to indicate only some approximate values, which when pieced together suggest a price that could be higher, on a per-kilowatt basis, than of one built indigenously. The reactors built at Rajasthan and Kalpakkam cost about Rs. 12,000 per KW at 1987 prices. Those being built at Narora and Kakrapar are in the range of Rs. 14,000 per KW, the increase being attributed to improved designs and higher safety standards.

At present, the Indian Nuclear Power Programme based on pressurised heavy water technology is mostly indigenous. With reference to the heavy water reactors, the imported items represent only 10 per cent in terms of cost. This is limited to some raw materials and special components in small quantities whose indigenous manufacture is not economical. Achieving such an extent of indigenisation has, no doubt, been a difficult exercise, involving inevitable delays due to the first time manufacturing of complex equipment to very high quality standards.

However, the spin-off benefits, including the upgrading of the quality standards of Indian industry, have been very significant. The confidence gained so far has been the basis of the long term nuclear power programme, with the target of an installed capacity of 10,000 MW by the year 2,000 through indigenous reactors. Towards this end, in the Seventh Plan (1985-90), work has already been initiated on Kaiga (2 x 235 MW) in Karnataka and Rawatbhata (2 x 235 MW) in Rajasthan.

In addition, work is being initiated on four more units of 235 MW each and six units of 500 MW each. The sites for these units are expected to be announced soon. Work is expected to be taken up in the initial years of the Eighth Plan on six more units of 500 MW each.

With regard to the future programme on fast breeder reactors at Kalpakkam, it is stated that a prototype fast breeder reactor of 500 MW size is being designed at the Indira Gandhi Centre for Atomic Research. However, a significant contribution to electricity generation from fast breeder reactors is expected only after another two or three decades. India has good reasons for pursuing fast breeder technology since its uranium resources are limited while the thorium resource is abundant.

PLEA TO EXEMPT HDPE SACKS FROM SALES TAX

Small-scale HDPE woven sack manufacturers have urged the Maharashtra government to withdraw the budget proposals to levy sales tax on their products. They have told the state's finance minister, Mr. Sushilkumar Shinde, that the levy would severely jeopardise the very existence of about 25 units, which had become sick in the past one year.

In a memorandum, submitted to the minister, the Maharashtra Small Scale Plastic Woven Sacks Manufacturers' Association has said that of about 50 such units, which had come into existence in the past decade, about half of them were forced to close down in the past one year following a Central government order requiring compulsory use of jute bags for packaging fertilisers, cement and foodgrains. Most of the remaining 25 units, which managed to survive the blow, however became sick, with heavy defaults of their dues to banks and to the financial institutions.

The association has said that the newly-levied sales tax would deplete the competitive strength of the woven sack units further and drive away the users. The sales tax would serve as an additional blow to these units, which had already been reeling under the impact of the Central order, it has said.

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The membrane cell technology will enable GACL to extend the life of the electrolytic cell to around 15 to 20 years and conserve electrical energy and improve pollution control.

The project for adopting membrane cell technology will cost around Rs. 35 crores and is expected to be implemented within 17 months. The engineering work of the project will be carried out by Uhde (India) Ltd.

A NEW MAN-MADE BIOCOMPATIBLE ORTHOPEDIC MATERIAL FROM SUMITOMO PHARMACEUTICAL

Sumitomo Pharmaceutical, Osaka, Japan has recently begun marketing Boneceram-P, orthopedic materials, developed jointly with Sumitomo Cement and Sumitomo Chemicals, the hydroxyapatite based Boneceram-P is reported to be biocompatible because of a network of spherical pores and ducts that encourage the transport of blood and nutrients that foster bone formation. Sumitomo Cement produces the new material, a polycrystalline product that hardly dissolves in most solvents, except for hydrochloric acid.

In Japan, Sumitomo Pharmaceutical is marketing six sizes of granules and four-shaped materials. The granules are priced at $77.22/gm. The smallest shape material measuring 15x18x12 mm, costs $501.93. The largest shape, 36x60x12 mm, costs $3,474.90. Therefore, the material is too high priced for mass consumption. (*Chem. Wk.*, 1/20/88, p. 27).

HIGH-TEMPERATURE SUPERCONDUCTIVE MATERIALS DEVELOPED IN JAPAN & USA

Sumitomo Electric Industries (SEI), Osaka, Japan has developed a holmium-based film that becomes superconductive at 84°K, with a critical current density less than 1 million amps/sq. cm. At liquid nitrogen's boiling point 77.4°K the current density is 2.54 million amps/sq. cm., the highest at that temperature.

The film was produced from holmium, barium and copper oxide. It was deposited on a single-crystal magnesium oxide substrate by a radio-frequency sputtering technique. The Ho-Ba-Cu O film quality has been maintained for at least a month. Citing these features, SEI believes that its new material represents a major advance 'for development of industrial superconductor materials'. Eventually applications will include Josephson junctions and other devices.

W.R. Grace has developed a proprietary process for manufacturing powdered ceramic-like material, which when cooled with liquid nitrogen, acts as a superconductor. The company will sell the material, 1-2-3 powder of yttrium, barium and copper oxide, through its subsidiary, Davison Chemical Div., a producer of rare earths. In addition, Grace's Washington Research Centre (Columbus, Md) will work with customers to help develop custom compounds with specific properties. Davison plans to produce powders in quantities larger than now available from a single source. Until now, superconducting compounds have generally been produced only in experimental quantities by individual laboratories. (*Chem. Wk.*, 1/20/88, p. 27).

A NON TOXIC SUBSTITUTE FOR THE CHLORO FLUOROCARBON CFC-113 DEVELOPED FROM ORANGE RIND

Under an international protocol agreed to in Montreal (Canada) in 1987, signatories must freeze consumption of chlorofluoro (CFC) 11, 12 and 113 in 1989. While CFC producers have potential replacements for CFC-11 and CFC-12 in development, until now these have been considered as an appropriate replacement for CFC-113, the use of which has been increasing rapidly in advanced countries of Europe and America for cleaning and degreasing in the electronic industry.

However, Petroferm (Fernandina Beach, Florida), a small specialty chemical company, reports it has developed a non-toxic, naturally occurring chemical product derived from orange rinds and other citrus products as an alternative to CFC-113. The product, the company reports, is a terpene hydrocarbon-based cleaner patented under the name Bioact EC7.

Experience with Bioact EC7 at American Telephone & Telegraph (AT & T) and other manufacturers has clearly demonstrated that it cleans printed circuit boards as well or better than chlorofluorocarbons or chlorinated solvents. In recent years terpenes have been the subject of considerable attention as ingredients in more environmentally acceptable cleaning products. Along with terpene hydrocarbons, Bioact EC7 contains specially selected surfactants that enhance the solvents cleaning efficiency. The product contains no chlorine and poses no threat to the earth's ozone layer.

This is a major breakthrough in the search for alternatives to chlorinated fluorocarbons. This product will allow

US electronic industry to dramatically reduce the use of CFC-113 in the electronic industry. AT & T, for example, hopes to eventually replace from a quarter to a third of the 3 million lb of CFC-113 it uses annually to clean its electronic products. Further substitution can be achieved without any increase in costs.

The petroferon products will not replace all the uses of CFC-113. For instance, terpene-based cleaners are not suitable for vapor-degreasing applications. They also have been shown to cause dermatitis after repeated exposure to the skin. It is reported that AT & T, Petroferon and EPA will cooperate in a continuing effort to ensure that Bioact EC7 can be used safely and effectively by the electronics industry. (*Chem. Wk.*, 1/20/88, pp 8-10).

JAPANESE FINE CHEMICALS FROM RICE FOR RESEARCH AND INDUSTRY

Japan has produced many interesting fine chemicals from rice by active research. Some of these chemicals will be marketed in the UK by BDH Industrial Products Division. These are from Touno Rice Fine Chemicals of Japan. These are expected to be of interest in the fields of cosmetics, health foods and pharmaceuticals.

Products include gamma-orysanol, a complex mixture of triterpenoid esters which has properties of interest for work in the fields of lipid lowering and certain nervous system disorders, particularly Whiplash syndrome. Topically, it can be used to increase sebum levels and improve peripheral blood flows. It also shows UV screen activity.

Also available is phytic acid and various salts. The parent compound possesses enormous chelating potential with metal ions and amino acids, reports BDH, suggesting applications in research into iron-induced oxy-radical diseases and also more general areas of chelate chemistry.

For further information contact: BDH Industrial Div., P.O. Box 11, Freshwater Road, Dagenham, Essex, UK.

A NEW PROCESS MAKES SILICON TETRACHLORIDE FROM KAOLIN CLAY

Toth Aluminium (New Orleans) reports it has completed its first bulk sale of silicon tetrachloride produced from abundant low-grade Kaolin Clay via its proprietary carbochlorination process. Silicon tetrachloride is conventionally made by the chlorination of silicon metal.

In Toth's process, the Kaolin Clay and coke are reacted with chlorine at high temperature to produce the volatile chlorides of aluminium, silicon, titanium and other metals in the clay. These are separated and purified into aluminium chloride and silicon tetrachloride.

Toth estimates worldwide demand for silicon tetrachloride at 800 million lb/year with growth of about 10% per annum. The material is used in the manufacture of silicon resins and rubbers, fibre-optic materials and principally, fumed silica for fillers and gels. (*Chem. Wk.*, Jan.6-13 (1988), p. 58).

A SOLAR-TO-CHEMICAL ENERGY PROCESS ON THE HORIZON IN ISRAEL

A solar-to-chemical-energy process, under development at Sandia National Laboratories (Albuquerque, N.M.) has been successfully field tested in Israel. A 20-KW solar furnace at the Weizmann Institute of Science in Rehovat was used to heat a gas mixture containing slightly more carbon dioxide than methane (to avoid carbon deposition problems) to 800°C over a rhodium alumina catalyst, forming hydrogen and carbon monoxide.

The idea is that the reaction products could be piped long distance, whereupon the chemical reaction would be reversed, liberating heat.

Sandia had originally planned to test the reverse reaction in a 300 KW system -- which H_2 and CO would be reacted over rhodium and nickel catalysts, generating in stages, CO_2 and CH_4 at 300-700°C. But the US Department of Energy cut out funds for the project.

Consequently the field test of the reactor will be done in West Germany in 1988 under an International Energy Agency project involving the USA, West Germany and Spain. The laboratory tests show that the entire process has an efficiency of 60-70%, compared with about 30% for converting solar energy to heat. (*Chem. Eng.*, 1/18/88, p. 18).

AN ANTIOXIDANT SYNERGIST FOR OXIDATIVE STABILITY OF POLYMERS DEVELOPED BY PENNWALT (USA)

Pennwalt (Phila, USA) has recently developed a low-cost antioxidant synergist that significantly improves the oxidative stability of polymers during high temperature melt processing and in end-use applications. Unlike sulfide and phosphite synergists, this new product (dubbed Anoxsyn 442) contains no ionic, polar, hydrophilic or hydrolyzable groups.

These attributes increase the usefulness of Anoxsyn in applications in which exposure to moisture is a major concern. (*Chem. Wk.*, Jan. 6-13, 1988, p. 58).

ENKA AG'S NEW SILICA REFRACTORY FIBRES GO INTO COMMERCIAL PRODUCTION

Enka AG (West Germany) has recently started commercial production of silica refractory fibres in West Germany. Production is in staple and filament versions and in low and high temperature variations. The development is based on 99.6% silicon dioxide of a non-crystalline structure.

Enka intends to aim at high temperature applications and the electrical insulation market, composite reinforcement and to meet certain chemical requirements. The LT version has a water absorption of 0.01 gram/gram at 40% rh and 25°C (77°F). Density is 1.8 gram/cu. cm. Other properties are:

* Tensile strenth -- 15 cN/tex;
* Modulus -- 0.7 daN/tex;
* Elongation at break -- 2%.

(*Textile World*, 6/1987, p. 38).

A NEW ALUMINIUM OXIDE-BASED CERAMIC DEVELOPED BY W.R. GRACE IN USA

W.R. Grace's Diamonite Products (Shreve, Ohio) a manufacturer of high temperature, high-strength technical ceramics, reports it has launched a "transformation toughened aluminium oxide" called GTC-JA, which contains dispersed submicron zirconium oxide in the aluminium oxide matrix. It is reported to be ideally suited for applications in which high wear or chemical attack are operating parameters. GTC-TA can be processed similarly to other aluminium oxide ceramics using dry pressing, wet and dry isostatic pressing and injection moulding techniques, but it has improved mechanical properties, compared with aluminium oxide, and has proved to be an alternative material to tungsten carbide in some selected applications. (*Chem. Wk.*, Jan., 6-13, (1988), p. 56).

IRRADIATING CERAMIC OXIDES WITH FAST NEUTRONS PRODUCES HIGH TEMP SUPERCONDUCTORS

Irradiating ceramic oxides with fast neutrons produces superconductors that show zero electric resistance near room temperature for at least 45 days.

Irradiation increased the superconducting temperature of Yttrium-barium copper oxide from 90K to about 200K and that of erbium-barium-copper oxide from 90K to 270-290K, says professor Hiroyuki Yoshida of the University of Kyoto's nuclear test centre (Kumatori, Osaka). A lanthanum-barium-copper oxide, a semi-conductor before irradiation, became superconducting at (27K) after neutron bombardment.

The materials were made by c cinating mixtures of various r materials at 800°C for 10 hou grinding (to reduce particle size less than micrometer), sintering 900°C for 25 hours, irradiating ir 5-MWE nuclear reactor, and cooli at between -250°C and 54°C helium (to prevent hydratio Yoshida reports that he has yet discover why irradiation promot superconductivity, but notes that f neutrons rather than thermal ne trons or gamma rays are responsi for the effect. (*Chem. Eng.*, 12/7/ p. 18).

* Bio Metallics has set up a jo venture with Texas Sulphur of Hou ton which will determine the fea bility of developing a microb system to convert gypsum to e mental sulphur with minimum ener utilisation.

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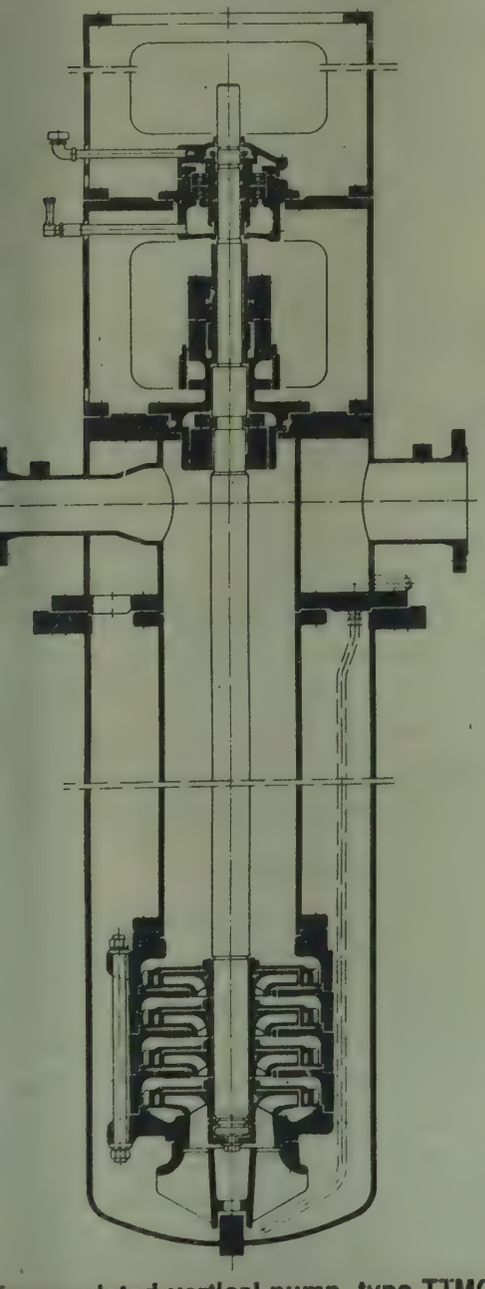
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Main applications

Refineries, cryogenics, pipelines, chemical and petrochemical installations, offshore technology, and wherever the installation conditions allow only low suction heads (HPSPinst).

For further details contact: Sulzer, CH8401, Winterthur, W. Germany.

INTELLIGENT AUTOMATIC HELIUM LEAK DETECTOR

The new ULTRATEST UL 500 is an intelligent helium leak detector of the new generation, whose equipment makes it suitable for both vacuum and overpressure leak detection.

Its primary application area is quality control of all types of components whose tightness is a precondition of durable operation and safety. In tank construction, for the testing of pressure vessels, liquid tanks, boilers, etc.

The rigorously engineered technical equipment of the ULTRATEST UL 500 offers automatic instrument-side adaption to the smallest specimens of some mm^3 in volume all the way up to large components with volumes of several hundred litres. It is also just as suitable for one-off tests as for the leak-testing of large numbers of items within short cycle times. A completely new vacuum concept and the application of two microprocessors create new scope for operational reliability and flexibility.

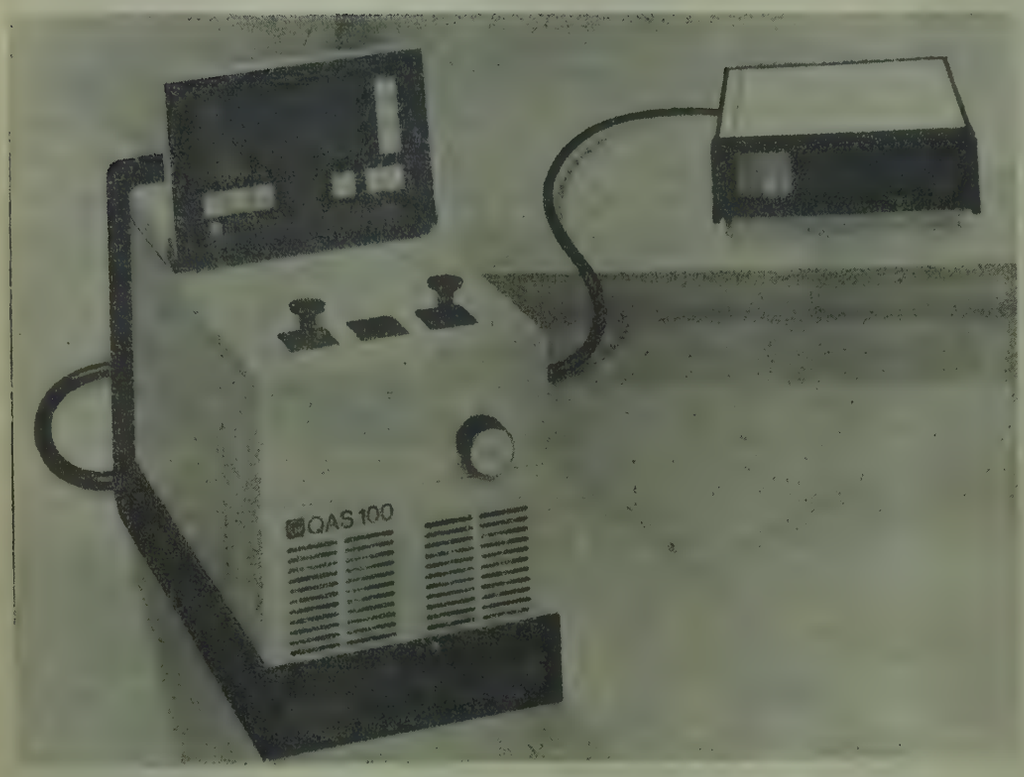


ULTRATEST UL 500 - Intelligent Automatic Helium Leak Detector

For further details contact: Leybold AG, Bonner Strabe 498, D-5000 Cologne 51, W. Germany.

THE FIRST PORTABLE GAS ANALYSIS SYSTEM WITH BUILT-IN INTELLIGENCE

The LH QAS 100 mass spectrometer sets new standards of modern mobile gas analysis. Gas analysis problems -- especially in response to progressively stringent legislation --are increasingly demanding mobile gas analysis systems that can be rapidly applied on-site. They should be easy to operate and meet the dif-



The first portable gas analysis system with built-in intelligence

ferent gas analysis requirements concerned. The QAS fulfils all these requirements, being transportable in any truck or van and powered by a stand-by unit, so that measurements on-site are possible at all times without mains connection. The first analytical results are available within a few minutes. The QAS 100 is well-suited to the following applications of environmental analysis:

-- ground air analysis during refuse dump probing
-- identification and assessment of gaseous contaminants
-- gas analysis of internal combustion engines (on-line).

For further details contact Leybold AG at the address mentioned on the previous page.

KITS FOR CHEMICAL SPILLS

Ansul Fire Protection (Marinette, Wis.), an arm of Australia's Wormald, has unveiled a set of kits intended for the safe, quick treatment of spills of many mineral and organic acids, caustics and organic solvents or fuels. The kit contains three proprietary agents for which patents are pending: Spill-X-A, which will neutralize and solidify many mineral and organic acids; Spill-X-C, which will neutralize and solidify many caustics and bases; and Spill-X-S, which will adsorb spills of many organic liquid solvents and fuels other than organic peroxides or hydrazine compounds, while elevating the flashpoint to about 140°F. Each kit contains six easy-to-handle, quart-size polypropylene containers that allow the product to be poured or shaken onto the spill, depending on the nature of the spilled chemical. Ansul says all three agents are free-flowing, colour-coded dry chemicals that will not produce toxic byproducts when used in chemical spills.

UNIFORM COAL SAMPLES

Because coal changes chemically and physically when exposed to air, results of coal studies are hard to compare. But now, Argonne National Laboratories (Argonne, Ill.) has completed a collection of standardized coal samples that are designed to "provide researchers with uniform samples that are identical as possible physically a chemically to unmined [coal]," sa Karl Vorres, manager of the Pr mium Coal Sample program. Eig types of samples are available, re resenting three major classes coal: bituminous, subbituminous a lignite. Samples are mined fr freshly exposed seams and a transported, mixed and processed ensure uniformity and stabil among samples. Then the coal crushed into two different sizes a is packaged under nitrogen flame-sealed, amber-coloured via

PORTABLE LUBRICATING OIL ANALYSIS EQUIPMENT

Oilab Lubrication Ltd., of Wolv hampton, U.K., has introduced IBM compatible software pr gramme in support of its highly su cessful, portable on-site lubricati oil analysis and wear monitori equipment.

Mr. Gary E. Newell, the Direct of the company, was a member the Scottish Council Developme and Industry (SCDI) trade mission introduce this equipment to Indi users. The equipment, which h had extensive and successful fie trials in the U.K., is portable, weig 12 kg, and can predict trends wh an oil requires corrective treatme or changing based on the data inp Expenditure on unncessary changes can be saved since change periods can be extende

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The system also indicates wh wear debris production rat become critical, thus giving a fo warning of possible catastrophies production stoppages due to failu of essential productive equipme Simple to operate, the OIL system provides a useful conditi monitoring equipment for maint nance engineers in the power g

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For further details contact British Deputy High Commission, Hong Kong Bank Building, Mahatma Gandhi Road, Bombay 400 023.

WASTE WATER TREATMENT SYSTEMS

Modi Consultants Limited provides turn-key execution of waste water treatment projects. The directors and associates of MCL have designed and installed several such systems in the USA which are meeting stringent EPA requirements.

The systems installed are for leather tanneries, petrochemical complexes and other inorganic and organic process plants. The design of process equipments are simulated on the computer and performance guaranteed.

The first step towards installation of treatment system would be an initial preliminary visit of MCL engineers to plant site after sufficient data has been gathered by MCL. Following this, MCL submits a proposal for the design, fabrication, installation and guaranteed performance of the complete treatment system. The treatment system could be initially for primary treatment only to be followed by secondary treatment.

MCL would utilise the latest technology in its design, procured and developed in the USA. MCL would also guarantee acceptance of the system by the pollution control board or any other regulating body. Systems by MCL are flexible and can be tailored to suit the requirements as well as the budget.

For further details contact Modi Consultants Limited, P.O. Box 47369, Bombay 400 058.

MULTIPLE EFFECT EVAPORATORS DESIGN

Modi Consultants Limited has developed a computer program for design of multiple effect evaporator systems. This program is presently marketed in the USA. Using this program with data suitable for Indian conditions, MCL provides turn-key service for the design, fabrication and installation of multiple effect evaprators.

The design efforts would answer questions like Economics of Evaporator design, Number of optimal effects, Heat distribution Area in each effect, Economics of recompression of steam, Type of Evaporator best suited for the application. Simulation of the evaporator would yield values for the conditions in each effect, Steam required, Steam Flow in each effect, Feed preheating etc. Using this design, MCL fabricates the equipments, installs them and guarantees its performance.

If an industry already has a multiple effect evaporator installed, MCL can undertake a study and advise on the optimum operating conditions for the set-up. The kinds of questions this study would answer are whether the equipment set-up is best suited for the application, the optimal arrangement (synthesis) of the set-up, modifications in design if required. Implementation of a study of this kind on a chemical plant in Andhra Pradesh reduced its steam consumption by 33%.

Concentration of solutions by the evaporation of a solvent from a solute is, with the possible exception of distillation, probably the unit operation that consumes the most energy. Installation of optimally designed multiple effect evaporator systems can reduce energy consumption by upto a factor of 10. A detailed study of an already installed evaporator/concentrator system can answer questions like whether it is being handled in the equipment best suited for the duty and whether the equipment is arranged in the most efficient manner.

For further details contact Modi Consultants Limited, Bombay.

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Imported 'TBL' brand thred seal tape made from 100% pure virgin PtFE (polytetrafluoroethylene is being offered by Bombay Machinery Stores as a most convenient, highly economical, permanent clean, quick wrapping, very easily and highly effective means of sealing threaded pipe fittings, in engineering, chemical and electrical industries.

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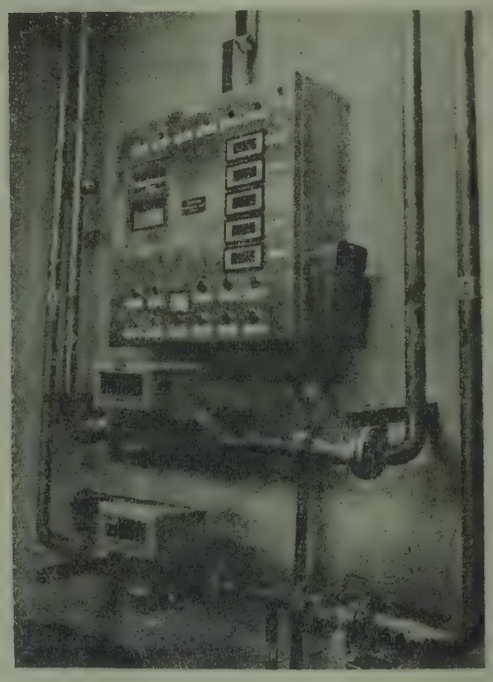
For further details contact Bombay Machinery Stores, 158/60, Narayan Dhuru Street, Bombay 400 003.

PHARMACEUTICAL PROCESS USING A PLC

Baker Perkins BCS, Special Project division, Peterborough, has just completed the writing and commissioning of software, at one site of Glaxochem, a major pharmaceuticals manufacturer. The software was for an Allen Bradley PLC-3 programmable logic controller. Linked to two Allen Bradley Advisor 2 Plus graphics terminals and 14 local operator stations, this single controller runs a programme of 230K, very large by PLC standards.

An innovative aspect of this project was the development of a Real Time Multi-Tasking Executive which, with its associated Editors, runs on the PLC. Though available on minicomputers, this, as far as it is known, is the first time such a system has run on a PLC. A major feature of the system is that a set of rules exist for writing a 'Task' and so long as these are obeyed, the Tasks can be changed, and others added, without risk to the integrity of the rest of the system.

User and functional specifications were generated in conjunction with the client in an effort to ensure that an appropriate structured approach to software development was used and thereby allow later changes to be more readily undertaken. In addition to the Sequence Executive, a considerable amount of work was done in writing software for the graphics system and in organising the data base so that it could be used by all sections of the programme.



One of the local control stations at Glaxochem

For further details contact: Ian Wright, Chief Press Officer, APV plc, Westfield Road, Peterborough, PE3 6TA. U.K.

TRIPLE MEASUREMENT OF DANGEROUS GASES

Bayer Diagnostic + Electronic GmbH, of Munich, a subsidiary of Bayer AG, has developed a conveniently sized warning device which simultaneously measures the concentration of methane, oxygen and hydrogen sulphide in air. The Tritox® instrument is specially intended for use by local authorities and is very simple to use. The device, which is worn on the body, is simply switched on, after which it gives an acoustic warning as soon as the concentration of any of the gases gets sufficiently close to a critical level. As the Tritox is only intended to attract the attention of the user to a gas hazard, the gas concentration itself is not indicated.

As a consequence of failure to check whether dangerous gases have accumulated, accidents are still happening frequently to persons entering shafts, sewers and tanks. In sewers and sewage treatment plants the main hazads are methane, hydrogen sulphide and lack of oxygen. The Tritox is supplied with a case, which is worn by the user. Its measurements are 23 x 11 x 4.6 cm and it weighs 1 kg.

For further information write to: Jagat Chemicals Pvt. Ltd., Express Towers, 17th Floor, Nariman Point, Bombay 400 021.

MICROGLASS FIBRES IMPROVE PRODUCT PERFORMANCE

Bayer AG has developed a new process for the production of microglass fibres (MGF). Those now being produced have diameters of down to 0.5 micron, and are longer, and have more uniform diameter distributions, than conventional microglass fibres.

The improved properties of the new fibres are turned to advantage in the manufacture of microglass filtration papers, for example, where the paper's tear strength is increased and a more accurately predictable pressure drop is obtained in filtration. As the requirements differ from customer to customer, and not just according to the field of application, the composition of the glass is carefully optimized

with the raw materials being chosen both according to our own research findings and accordiing to the experience gained by well-known glass manufacturers. Therefore, apart from microfibres consisting of C-glass (chemically resistant glass) with various degrees of chemical resistance and trace element contents, Bayer supplies E-glass microfibres (resistant to alkalies) with a composition close to that of diabase (a material similar to basalt).

In addition to being incorporated in highly efficient filtration and separation papers, and in seals, friction materials and medical diagnostic aids, microglass fibres are very effective as a reinforcing material for high performance composites and composites in general.

In these areas microglass fibres have conspicuous advantages over chopped strand glass fibres, making the surface of the article smooth, and enebling it to be painted or electroplated without pretreatment. Microglass fibres also have the advantage that, in addition to reinforcing the article as well as or better than conventional fibres, they help to reduce its weight. Furthermore, they enhance the transparency of transparent materials, and flow better in liquid, pasty or molten systems.

Catalyst supports (made with e.g. metallized fibres) and active ingredient carriers of large surface area are other products in connection with which the use of microglass fibres is developing rapidly.

For further information write to Jagat Chemicals Pvt. Ltd, Bombay.

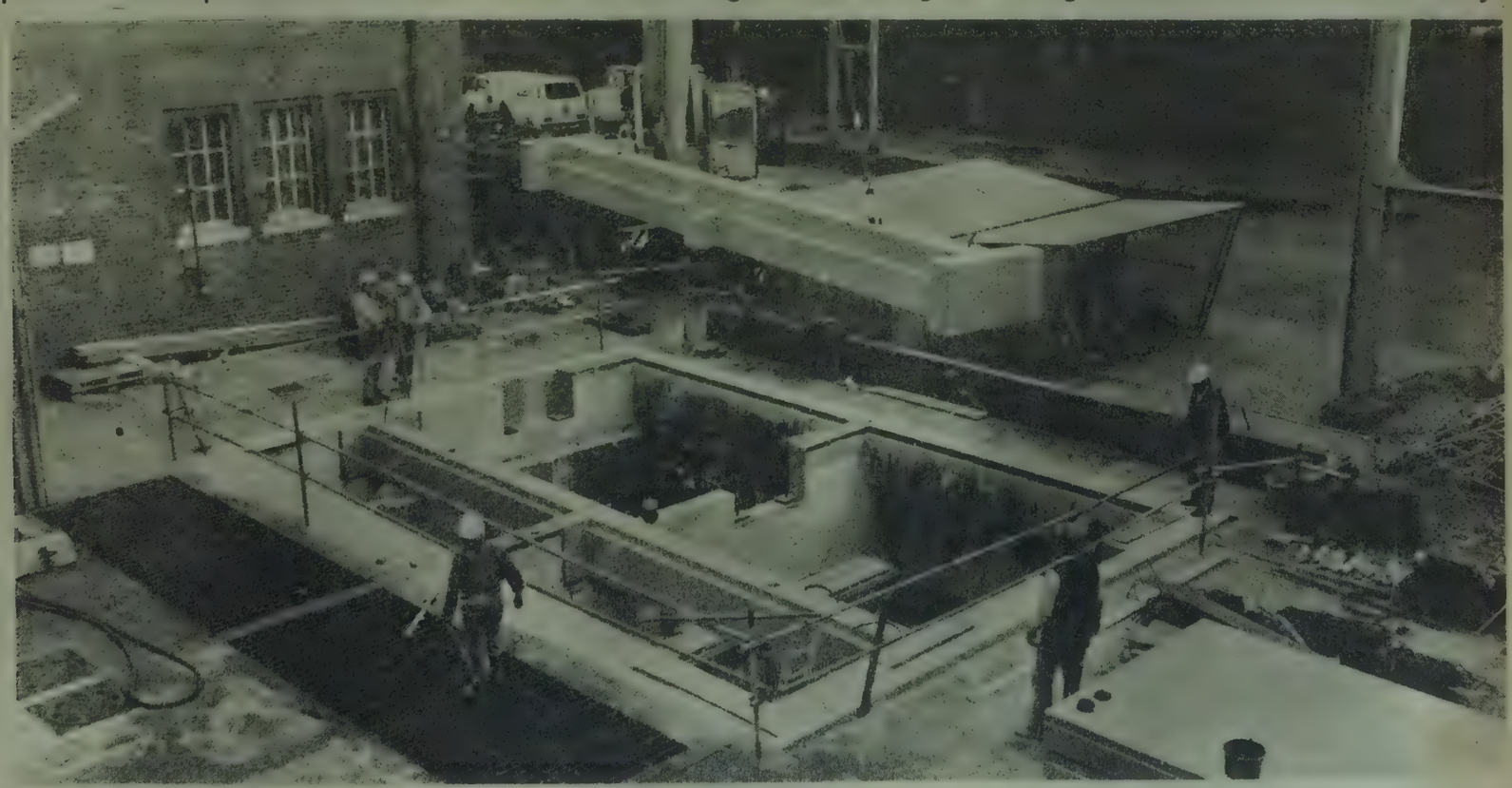
NEW CORROSION RESISTANT MATERIAL DEVELOPED BY BAYER

Rust on the covers of tanks in which salt is dissolved, e.g. for water treatment purposes, is often a major problem Bayer has now overcome it using a new composite material. The concrete girders holding the gratings in place over the tanks are protected from corrosion by reinforcing them with pre-tensioned rods of ®Polystal. This high-strength glass fibre composite from Bayer AG is particularly suitable for use as a pre-stressed reinforcement; it has a lower elasticity modulus and higher elasticity than steel tendons.

The concrete girders -- which have to take the weight of the heaviest lorries -- each contain a tendon consisting of 19 ®Polystal rods inside a duct, with a permissible service load of 600 kN. Once the concrete is sufficiently firm, the tendon is pre-tensioned to the service load and the duct then filled with a polymer grout specially developed for the purpose by Bayer.

This corrosion-resistant form of pre-stressed reinforcement greatly increases the service life of such heavy-duty structural components.

For further information write to Jagat Chemicals Pvt. Ltd., Bombay.



Salt dissolution tanks unaffected by rust: The photograph shows the installation of trafficable concrete girders that hold the gratings in place over these tanks. The girders are reinforced with ®Polystal, the high-strength glass fibre composite from Bayer AG, giving them long term protection against rust.

ENDING FACTORY SMELLS

Using ultra-violet light and ozone gas, a British research them has discovered a highly efficient method of detroying undesirable factory smells. Britain's Electricity Council carried out extensive field trials at a chemical works to destroy the odour from a reaction vat containing chlorophenol products. These showed that their new UV/ozone gas scrubber could cut the chlorophenol concentration in the air to a thousandth of its original value.

To develop the technique, scientists built on the research council's specialised knowledge of ozone technology. Ozone is an extremely efficient oxidising agent and researchers first employed it several years ago to destroy highly toxic penolic pollutants from chemical works, oil refineries and coking plants. Now the Electricity Council's Research Centre believes that it has developed a technique that is far superior to existing methods of eliminating industrial odours such as trying to mask them with a sweeter smell or incineration.

Gas liquid scrubbing, in which the bad-smelling air is passed through a liquid spray, is the method used. By improving on the reactivity of ozone and combining it with ultra violet light, it is capable of destroying totally almost any smell or organic chemical in a gaseous effluent. The pilot equipment shown here is relatively simple, consisting of a vertical cylinder with a battery of low pressure mercury lamps immersed in water at its base. This is one of many electrical products and processes developed at the research centre and licensed worldwide. Most aspects of industrial processing are covered, and many concern the protection of the environment. One process recently licensed is an electric rotary kiln for drying and calcinating a range of granular products including pharmaceuticals, food and building materials.

For further details contact Electricity Council Research Centre, Capenhurst, Chester Ch1 6ES, England.



AMORPHOUS SILICON FROM RICE HUSK

Ordinary rice husk may soon be used to prepare amorphous silicon, a material used in the manufacture of solar photovoltaic cells which help convert sunlight into electricity. A team of engineers from the Indian Institute of Technology, Kharagpur, has found a way to turn rice husk into a gaseous compound of silicon and hydrogen called silane.

Rice husk, when burnt, leaves behind a residue containing about 95% silica. This is purified further by boiling it in acids, a process called acid leaching. After a purity of about 99% is achieved, it is converted into a compound of magnesium and silicon. This is hydrolysed to produce a mixture of silane and disilane gases. The mixture is then separated into its constituent gases through fractional distillation. All the silane gas currently being used in the country is being imported at about Rs. 1000/kg. The silane from the rice husk will cost only about Rs. 100/kg, Dr. H.N. Acharya, team leader at IIT has said. The country today uses between 10-15 tonnes of silane annually but this is expected to increase in coming years, Acharya said.

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Chemical News From Abroad

NOBEL IN THE RUNNING TO ACQUIRE BEROL KEMI

Procordia, the Swedish state controlled industrial conglomerate, is in talks to sell its speciality chemicals business Berol Kemi. Nebel Industries has held talks with Procordia and along with another Swedish chemical group, Perstorp, is believed to be a leading contender.

A "handful" of other companies are also said to be interested in acquiring business and talks are believed to have reached an advanced stage. Berol chairman Olle Enstam said that he expects an agreement to be concluded shortly.

Berol has four main operating divisions: surfactants, water soluble polymers, amines and ethylene oxide. Most of the latter (95% in 1986) is produced for captive use as a raw material for the other three sectors. Berol operates an ethylene terminal in a joint venture with Finland's Neste Polyethylene at Stenugsund in Sweden. The terminal has a capacity of 18,000 ton.

In 1987, Berol expects to see pretax profits of around Skr50m ($8.2m) on sales of Skr900m. The speciality chemicals firm has a relatively high level of research and development expenditure compared with most chemical concerns and may prove attractive to companies with a less well-developed R & D base. It has concentrated efforts mainly in pulp and paper, minerals processing, energy technology, metal working and biotechnology/-surfactants.

Enstam said Procordia is "trying to find a good owner for Berol". He did not specify which companies were involved in talks for the business, but sources suggest there may be as many as seven firms still in the running including Nobel and Perstorp.

Reports in the local press tip Nobel as the leading contender for Berol. A substantial part of Nobel's turnover is in the pulp and paper and speciality chemicals areas, and Berol's operations would provide a good fit. Nobel would also benefit from Berol's emphasis on R&D.

Procordia, according to Enstam, is selling its chemicals business in order to focus on three main areas: pharmaceuticals, consumer products including brewing and tobacco, and services which encompass its hotel and restaurant operations.

ERT, REPSOL LINK MOOTED

Spain's Repsol may be poised to acquire a stake in ERT's Huelva refinery in the south of the country. Although ERT denies any formal negotiations have taken place, sources in the company suggest chairman Jose Maria Escondrillas would like a "partner" in the refinery. According to Repsol sources, any deal will involve Repsol Petroleo, the group's oil refining and base petrochemical unit.

The La Rabida refinery at Huelva processes 4m ton/year of crude oil and has an attached petrochemical plant with capacity for 120,000 ton/-year benzene and 80,000 ton cyclohexane.

Reports from Madrid suggest that ERT may be seeking a joint venture with several groups including Repsol and some crude oil suppliers. Repsol, meanwhile, has announced profits of Pta57.4bn ($497m) for 1987 on sales of Pta885bn. These are Repsol's first results following its formation last year with the merger of the state-owned companies Hispanoil, Butano, Alcudia and EMP. In 1986, the profits of the four totalled Pta29bn.

Repsol Petroleo -- formerly EMP -- saw profits jump by 300% to Pta24bn. Repsol chairman Oscar Fanjul said this major improvement is due to the performance of base petrochemicals which saw most plants operating at or above nameplate capacity.

Repsol Quimica, the group's chemicals arms formerly called Alcudia, saw profits double from Pta5.6m in 1986 to Pta11.3bn. Sales rose from Pta90bn to Pta97bn.

Fanjul said chemical results would have been even better if operations at Tarragona had not been disrupted by an ETA bomb attack last spring.

AIR PRODUCTS TAKES STAKE IN SAN FU

Air Products and Chemicals has acquired a 45% stake in Taiwan's second largest industrial gases concern, San Fu Chemical Co. The deal is reckoned to be worth over $10m.

San Fu, which has around a third of the Taiwan industrial gases market, has annual sales of around $20m with some 60% of this coming from its gases business. The company also manufactures food additives, mainly for the local market.

According to Air Products, Taiwan's industrial gases market is expected to grow rapidly Plans to expand San Fu's operations are already under way. A speciality gas facility catering for demand from the electronics industry was recently completed at Chupei.

NOVA UPS STAKE IN POLYSAR

Canada's Nova Corporation has succeeded in raising its stake in Polysar to just under 25%, the maximum it can hold under Canadian law. It secured a further 13m shares after raising its original offer from Can$14 to Can$16/share. Meanwhile, Polysar has started restructuring moves which entail the redistribution of a major chunk of its assets to shareholders.

Nova is keen to reopen talks to negotiate the sale of Polysar's petrochemicals business, but a Polysar spokesman said the company was not interested. "It's business as usual," he said, adding that the company intends to go ahead with the second part of its restructuring. This will be voted on by shareholders at a meeting on April 29. The Polysar spokesman said the company was confident of obtaining approval from a majority of the shareholders.

EEC DECISION OPENS MARKET TO ASPARTAME PRODUCERS

Two newcomers to the aspartame market have won their right to compete in Europe with NutraSweet, the dominant player. This follows the European commission's decision to block exclusive long term supply agreements between NutraSweet and its main customers Coca-Cola and PepsiCo.

Holland Sweetner Co. (HSC) and Angus Fine Chemicals complained to the commission in 1986 alleging that the NutraSweet contracts infringed Article 85(1) of the Treaty of Rome. As a result the contracts have been amended so they no longer contain exclusive purchasing provisions. They do, however, provide for Coca-Cola and PepsiCo to purchase a fixed quantity of aspartame from NutraSweet for two years.

Commenting on the outcome HSC's marketing manager Jan Dopper said, "HSC is delighted that its complaint was taken serously. Coca-Cola and PepsiCo are very important consumers; now we can negotiate freely for a supply position in the EEC".

HSC is in the process of starting up its new aspartame facility at Geleen in Holland. Dopper declined to give the plant's capacity, but revealed it more than met EEC needs. Product will be exported to other markets, with the exception of the US where NutraSweet's patents run until the end of 1992. HSC is looking to take a 30-60% share of the world market outside of the US.

Dopper expects good growth in demand for aspartame, particularly in Europe. Here approval for use of the low calorie sweetener has been slow, but now most countries are permitting its use. At present world demand for the product stands at around 6,000 ton/year, with the US taking about 5,000 ton/year, according to Dopper. The remainder is shared between Canada, Europe and the rest of the world. HSC believes that aspartame demand in Europe will easily triple over the next five years.

Aspartame prices in the US are higher than elsewhere, with product selling at around $150/kg. Non-US prices tend to be below $100/kg. HSC claims that NutraSweet is hiking prices in the large US market to allow it to underprice European product. However, Dopper says HSC will be able to compete with NutraSweet's prices.

Following the EEC decision, NutraSweet spokesman Evan Currie commented, "The company will continue to compete vigorously for all its customers in Europe and earn its place in the market". NutraSweet believes the EEC was acting unnecessarily in blocking the agreements, though, as Coca-Cola and PepsiCo had entered the deal "of their own free will".

NutraSweet has two aspartame plants in the US. It also operates a plant in Japan in a joint venture with Ajinomoto.

Angus Fine Chemicals has recently commissioned a fine chemicals plant in Ringaskiddy, Eire which can make aspartame. The company says the EEC decision provides the market with a choice of supplier and it will assess the market over the next year with regard to starting up production of aspartame.

ERT OPENS DOOR TO KUWAITIS

The long-running battle for control of Spain's ERT appears to be drawing to a close. Chairman Jose Maria Escondrillas has apparently softened his opposition to Kuwaiti involvement in the Spanish chemicals giant and is said to have agreed to allow senior managers from Kuwaiti-backed Cros to hold seats on his company's board.

According to sources in Madrid, Escondrillas had little choice other than to accommodate in some measure the wishes of the Kuwait Investment Office which has become ERT's leading shareholder. The ERT chaiman has apparently been allowed to retain his position in return for granting KIO nominees seats on the board.

Before the meeting between ERT and Cros, speculation suggested that the KIO was poised to use its majority voting rights to force Escondrillas to resign.

In a related move, Mario Conde, former head of Antibioticos and chairman of the Banesto bank, said

his company is prepared to buy a 18% stake in ERT for around Pta 11bn ($96m). The stake is currently held by ERT itself. Conde's offer is apparently designed to set Banesto up as a counterweight to the KIO within ERT's shareholding.

Conde believes that there are synergies between ERT's and Banesto's mining and oil refining interests. He also believes that Banesto's presence in ERT could help to speed the conclusion of a fertilizer merger between ERT and Cros.

If Banesto takes a stake in ERT, it may encourage other chemical companies to form alliances with the Spanish chemical major. Sources within Banesto say that at least one major European chemical company has expressed interest in linking up with ERT.

DEAL CLOSE ON MIRA LANZA PAPER UNIT

Further details have emerged on the sale by Ferruzzi of its stake in Mira Lanza. The buyer, West Germany's Benckiser, is to take over the first 15% of Ferruzzi's 54% stake on April 27. But Benckiser assumes voting rights for the whole stake and takes full control of Mira Lanza's operations through its Italian subsidiary Benckital from April 27.

The balance of the shareholding -- 39% -- reverts to Benckiser on March 1, 1989. Payment takes place in a number of instalments and will be completed by December 1990.

The price tag has been set at a nominal figure of L297bn ($236m) which translates to around L240bn in real terms.

According to a spokesman for Ferruzzi, talks on the sale of Mira Lanza's paper business are at an advanced stage, and are expected to be completed before April 27.

It is believed that negotiations are taking place with Kaysersberg of France, a 50-50 joint venture between Mira Lanza and the US-based James River group, and with James River itself. There may also be other interested parties.

In brief.....

* Norsk Hydro has expanded its biomarine sector -- seen as one of the company's key growth areas -- with the acquisition of Jahres Fabrikker from another Norwegian firm, Kosmos. Jahres Fabrikker specializes in fatty acids and their derivatives. Purchase price was not disclosed.

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Chemical Markets Abroad

INCREASING DEMAND PUTS SQUEEZE ON PHENOL

There is little doubt that Europe's phenol market has tightened dramatically since Christmas on the back of increased downstream demand and supply shortfalls. But while prices have rocketed and traders report there is virtually no spot product available in Rotterdam, producers' and buyers' ideas about the maret differ from "tighter than ever" to "reasonably balanced".

Contract prices have leapt from DM1350-1400ton in Q4 last year to DM1600-1675/ton in Q1 although some producers are quoting contract levels "for loyal customers" in the range DM1500-1550/ton.

In the spot market the story is quite different. As most producers' product is tied up under contract, traders are left handling small lots of 100-500 ton. Domestic European prices for these lots are in the region DM1700/ton although these numbers are mostly "academic", traders say. Those who are able to get spare product are more interested in selling into the export market, mainly to the Far East and US at $1100-1150/ton fob Rotterdam. "Compared to a Deutschmark free delivered price, this is much more favourable," said one.

Japan is believed to have entered the market looking for 2-3000 ton but with current shortages in the US this product is most likely to come from Europe, sources say.

But there is some hope for those buyers forced into spot deals, as some Eastern Bloc material has been filtering through into the spot market on an "erratic basis".

The recent tightness, however, in Europe and the US has been exacerbated by the explosion at Georgia Gulfs 150,000 ton/year phenol plant at Plaquemine in the US on January 25. The accident occurred while the unit was being brought back on stream following a routine shutdown and although production resumed two weeks after the incident, European observers expect the effects of the supply hiccup to last well into Q2 on both sides of the Atlantic.

One large UK buyer said he had been worried about product availability for some time and had taken precautions to stock up on product in the event of a production shortage like the one currently being experienced.

"We saw these shortages and price rises coming before the new year and fortunately we are covered at the moment," he said. But he added that he was "not relaxed".

Another factor behind the shortages is that growth rates for downstream products are exceeding expectations. Last year observers were predicting phenolic resin demand of 1-2% per year. This is now considered to be pessimistic and producers say they are looking at 4-5% per year for resins and between 6-7% for Bisphenol-A, used in polycarbonate production.

Although these figures are lower than industry estimates between 1980-1987 which reached 10% per year, the bis-A sector still shows the greatest growth potential. Demand from the car and construction industries meanwhile, also remains strong and the latter is expected to increase as the weather improves.

Price hikes in April are almost inevitable say producers who, while protecting their own interest, are acutely aware that customers are having a rough ride. Both parties agree that there will be little respite on prices which will continue their upward trend in the next few months.

Until recently benzene feedstock costs were not a consideration in the phenol price picture, but with the sudden increased interest in aromatics sending benzene spot prices to $330-340/ton and numbers being talked up to $350/ton, it is widely believed that buyers will have to face price rises at least until the summer.

However, buyers may have some cause for relief. Despite the acute shortages in the US recently prices did not move significantly and remained at $837-890/ton fob. This, observers believe is some indication that the market has reached a plateau.

In the UK, where one buyer was forced to admit that the market was "reasonably tight", contract prices are on a par with the lower Deutschmark level of DM 1500/ton being quoted on the continent.

Numbers between £520-540/ton free delivered in 20 ton trucks have been obtained by buyers taking bulk quantities this month. In one case £515/ton was heard.

R-P BOOSTS CHINESE, EAST BLOC TRADE

Trade between French chemical major Rhone-Poulenc and Comecon countries and China grew by 27% to FF3.1bn ($541m) in 1987 and accounted for some 60% of the company's total exports.

According to Rhone-Poulenc the improvement was a result of increased trade with in particular, the

Soviet Union and China which accounted for some 30% and 15% of the total respectively. The company also registered a good performance with Poland and Bulgaria and retained its export positions in Czechoslovakia and East Germany.

NIGERIA'S FIRST FERTILISER PLANT

Nigeria's first nitrogenous fertilizer complex at Onne, Rivers State is fully commissioned. The $800m. plant is designed to produce 300,000 ton/year ammonia, 400,000 ton/year urea and 300,000 ton/year NPK (nitrogen-phosphorous-potash) mixed fertilizer for Nigerian and export markets. It is run by the National Fertilizer Company of Nigeria (Nafcon).

Running on natural gas from the nearby Alakiri field, the ammonia plant has been producing at 115% of its design capacity. Ammonia output is used as feedstock for urea production, which itself is 7% over design capacity.

Nafcon has just received an order for 75,000 ton of granulated urea from the Nigerian federal ministry of agriculture for this years planting season. Nafcon says that the granulated urea made at Onne is easier for farmers to handle and a more effective fertilizer. Excess urea has been exported to US, Spain, France, UK, Germany, Belgium, Canada, Cote de Voire and Cameroon.

Around 40% or 200,000 ton of Nigeria's NPK requirements will be met this year by the new mixed fertilizer plant. Producing all the country's urea needs and eventually 60% of NPK requirements, the complex will save Nigeria approximately Naira440m ($100m) in foreign exchange each year.

The financial internal rate of return of the project, based on current world prices, is estimated to be 16%. Plant construction began in 1983, and was led by a multinational consortium headed by M.W. Kellogg. Other consortium members were Kawasaki Heavy Industries, Marubeni Corp., Nissho Iwai of Japan, and Jacobs Engineering of the US.

NOBEL REBUILD?

Sweden's Nobel Industries is considering a proposal by Iran to rebuild a bomb-damaged petrochemical complex at Isfahan, Iran. The company has already helped to extend Iran's chemical facilities with the construction of a refinery which has a capacity of 250,000 barrels/day.

Bert Janssen, managing director of Nobel engineering unit, Nobel Chematur AB, is leading the negotiations with Iran and reports that the proposals include contracts worth as much as Skr10m ($1.7m). But the Swedish firm says it will not enter into an agreement until the Iran-Iraq war is over.

A Nobel-built plant at Isfahan was destroyed in 1986 by Iraq after defense experts confirmed that the facilities could be used to manufacture explosives and other war material.

ARGENTINA SLASHES IMPORT DUTIES

The Argentine trade ministry has reduced import duties on a wide range of petrochemical products, in an attempt to reduce costs for local industries. It will also relax bureaucratic procedures which hampered past import deals.

Pending government approval, the new import tariff will stand at 25% of the product's imported value for petrochemical intermediates, a reduction of 22%, and will be eliminated for some petrochemical feedstocks.

In addition government consent is no longer needed for feedstocks. It is hoped that these moves to reduce protectionism will boost investment from both local and foreign companies, as well as lowering costs for downstream industries. According to Argentine sources, propylene feedstocks are in short supply.

Feedstock prices, meanwhile, have been increased by the government. LPG, naphtha, and refinery gases are now 80 to 90% of world prices. Price setting will allow companies to make long term investments with more certainty. It will also boost income at Argentina's loss making energy and petrochemical companies Gas del Estado and Yacimientos Petroliferos Fiscales.

A significant gas field has been discovered off Tierra del Fuego, which will extend Argentina's gas reserves from 40-50 years. Sources say more effort will now be centred on developing gas as a feedstock for petrochemicals. Argentina's oil reserves currently stand at 15 years.

PP TO TOP 3.7M TON

Polypropylene demand in Western Europe is likely to reach 3.6m ton/year by 1995, according to David Oxley of Chem Systems. In an update on projected demand growth, Chem Systems also predicts that US demand will reach 3.7m/ton by 1995, a year-on-year rise of 6%.

PP demand 1986-95 ('000 ton)

	W. Europe	US
1986	2,330	2,140
1987	2,600	2,335
1990	3,000	2,910
1995	3,600	3,710
Growth 86-95	5%	6%

Source: Chem Systems

JAPAN'S ETHYLENE MAJORS OPEN MOTHBALLED PLANTS

The lifting of Japan's temporary measures law on ethylene, enforced by trade and industry ministry MITI in 1983, has paved the way for the country's producers to bring idled plant back on stream to meet buoyant demand.

Last year some 4.3m ton of ethylene capacity was operational, but because of improvements in operational efficiency and postponement of maintenance shutdowns, as much as 4.7m ton was produced. This year demand for Japanese ethylene is expected to reach 4.8m. ton.

Around 300,000 ton of extra capacity is expected to be brought on stream by the summer from demothballed plants. These capacity increases will be the first for six years. MITI is allowing the restarts on condition that it is informed and has a three month lead time.

This month, Mitsubishi Petrochemical, Japan's leading ethylene producer with a total capacity of 510,000 ton/year is restarting a 26,000 ton/year plant at Kashima and a 23,000 ton/year plant at Yokkaichi. Idemitsu Petrochemicals is bringing a 50,000 ton/year plant back on stream at Tokuyama, where it produces 151,000 ton/year of ethylene and has 99,000 ton/year mothballed. Maruzen Petrochemical is also restarting some 22,000 ton/year of its idle capacity at Chiba this month.

After April, Sanyo Petrochemical plans to restart its 41,000 ton/year plant at Mizushima, where it has a current capacity of 349,000 ton/year. Shin Daikyowa is also preparing to reopen its 54,000 ton/year plant at Yokkaichi, where it presently produces 226,000 ton/year ethylene.

The largest restart is mooted for July, when Showa Denko is proposing to run its 210,000 ton/year idled Oita ethylene plant at 60% capacity. All these restarts involve reopening furnaces, rather than debottlenecking.

Between 400,000-500,000 ton/year of ethylene capacity is mothballed in Japan, but according to sources a further 500,000 ton/year lies idle. If demand increases it is possible that these plants could be brought back on line.

An additional 5 to 7 per cent surplus could be achieved by scheduling maintenance shutdowns biannually rather than annually, and improving yield on feedstock.

The driving force behind the ethylene demand hike lies in Japan's high GNP, which is expected to reach 5% this year. Particularly high ethylene users are the construction and automobile industries. Demand from South Korea and Taiwan is also strong. It is reported that South Korea will remain in ethylene deficit despite two 400,000 ton/year ethylene plants due on stream next year. Separate sources say ethylene producers in Japan are worried that the new Korean capacity will generate cheaper products, which the Koreans may be keen to export to increase their foreign currency earnings.

Taiwan, which has suffered delays in cracker projects because of feedstock and environmental concerns, could also remain an export market for Japan's ethylene. A petrochemicals receiving terminal and storage facility are currently being built in Taiwan, and completion is expected later this year.

Downstream ethylene chemicals are also buoyant in Japan. Vinyl chloride production is at record levels of 1.6m ton/year and both ldPE and hdPE output are expected to rise this year.

MITI is proposing to lift regulations on six other petrochemical products, including polyolefins, styrene monomer and PVC. The Japanese cabinet will consider the proposals at the end of this month.

ETHYLENE CAPACITY IN JAPAN ('000 ton/year)

Company	Plant	Current capacity	Sleeping capacity
Mitsubishi Petrochemical	Yokkaichi	211	30-39 50-65
	Kashima	299	20-26
Sumitomo Chemical	Chiba	345	0
Tonen Sekiyukagaku	Kawasaki	350	0
Maruzen Petrochemical	Chiba	373	20-22
Idemitsu Petrochemical	Chiba	220	20-25
	Tokuyama	164	0
Sanyo Petrochemical	Mizushima	359	40-41
Mitsubishi Chemical	Mizushima	360	0
Ukishima Petrochemicals	Chiba	466	0
	Kawasaki	342	0
Showa Denko	Oita	320	220
Shin-Daikyowa Petrochemical	Yokkaichi	266	50-54
Osaka Petrochemical	Senboku	252	40-48
Total		**4,327**	**440-475**

In the European Market

Naphtha prices slipped to $138-142/ton reflecting tumbling crude oil levels.

With European consumers well served on the ARG pipeline, ethylene spot business was subdued. Prices weakened to $395-405/ton cif NWE, with the only business being a 4,000 ton parcel bought by a trader at $395/ton cif. Business in the Med was unspectacular with only the movement of 3,300 tons between traders at $385/ton providing a talking point.

Propylene activity was also lacklustre, and levels were around DM540-550/ton cif NWE although buyers' and sellers' ideas still diverge. The only deal heard in NWE was 4,000 ton polymer grade at DM550/ton cif, although levels of DM530/ton were rumoured in the Med.

Butadiene prices took another knock on the back of dwindling levels reported in the US Gulf. Prices were slumped to 18 cents/pound and were rumoured as low as 15 cents/pound. With no deals struck in NWE, notional levels were put at around $300-320/ton fob. As crude C_4 prices slipped to $120/ton, producers were maximising co-cracking was and some butadiene cracking reported as producers tried to cut surpluses.

Benzene prices continued their upward trend to reach $375-385/ton although numbers as high as $390/ton were heard. Uncertainty in the US over contract pricing has left the European market cautious but held up US spot at $1.20/gallon.

Toluene rose to $280-295/ton although with the sharp decline in oil prices over the last week and gasoline still falling, traders suggested that prices will level off shortly. Availability was tight but as most majors had bought for HDA conversion supply was expected to ease.

Demand for xylenes remained firm with solvent up between $270-280/ton and virgin at $280-290/ton.Few deals were concluded although a major sold 1,000 ton solvent at $272.5/ton fob Rotterdam. In the US, mixed xylenes rose to 95 cents/gallon on the back of export demand but 1,600 ton was done on a barge at 90 cents/gallon, well within the European range.

Paraxylene prices lifted again to $590-610/ton but with less force than last week. Demand was strong and traders say $620/ton was rumoured.

Orthoxylene however was weak although numbers were up a little to $330-340/ton partly because of PX interest.

Styrene firmed and prices were around $1,600/ton. There were several inter-trader deals with one buying at $1,575/ton and $1,585/ton and selling for March delivery at $1,595/ton.

Strong chemical demand for methanol pushed T2 material up to $178-183/ton fob. However, the price was too high to be of interest to gasoline blenders.

Sabic was said to be looking for European spot possibly for export to the Far East and Rumanian material was being offered at $170/ton fob.

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* *Analysis of spot prices prevailing in the first week of March 1988.*

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News From the American Market

DEGRADABLE PLASTICS JOINT VENTURE INCLUDES POLYSAR

Polysar (Leominster, Mass.), the plastics division of Polysar, Ltd. (Sarnia, Ont.), has formed a joint venture with Eco of Toronto to develop worldwide markets for a broad range of degradable polystyrene (PS) resins. The new venture, Ecosar Enterprises, is headquartered in Leominster. The resins will be made using the Ecolyte process patented by Eco to produce plastics that disintegrate in ultraviolet light. Ecolyte plastic products retain their original strength as long as they are not exposed to direct sunlight, Polysar says.

Eco manufactures and sells several types of degradable plastics, but the venture with Polysar is its first involving PS. Because PS is widely used in disposable packaging, it has been singled out as a contributor to landfill overcrowding. In an effort to confront the solid waste disposal issue, several PS makers have looked into ways to make their resins degradable.

OIL PRICES WILL BE FLAT, AND U.S. IMPORTS WILL RISE

Oil prices will hover at $17-20/bbl until 1990 but after that will rise "well in excess of inflation" and should exceed $25/bbl by 1994, says Scott Jones, senior vice president for energy, metals and materials at Wharton Econometric Forecasting Associates (WEFA) in Philadelphia.

At an energy conference sponsored by WEFA in February in Los Angeles, Jones said that the rise in oil prices will be a reflection of the Organization of Petroleum Exporting Countries (OPEC) having more say in the global oil market. U.S. oil imports, he explains, will account for roughly 50% of consumption by 1990-91, and much of the imported material will be produced by OPEC. Worldwide demand for oil will increase 1-1.5%/year through the mid-1990s, predicts William Hermann, chief economist for Chevron (San Francisco) which means that total oil demand will be more than 50 million bbl/day. OPEC, he estimates will supply half of the world's oil needs, compared with its current output of 16-17 million bbl/day.

The odds against congress approving an oil import fee in 1989 are more than five to one, Jones says. "A gasoline tax has a much higher probability of being enacted", he adds. "Besides being simple to administer, the rule of thumb is that a 1¢/gal increase in federal gasoline tax generates $1 billion for the Treasury coffers".

ALCOA AND COASTAL WILL MAKE LIQUID SODIUM ALUMINATE

Alcoa (Pittsburg) and Coastal Products and Chemicals (Houston) have formed a joint venture, Alcoa-Coastal Chemicals, to produce and market high purity liquid sodium aluminate. The venture's aim is to meet growing merchant demand for the product, which often is produced *in situ* by users.

The clear, high-density liquid made from alumina trihydrate and sodium hydroxide is used in municipal and industrial water-treatment plants and by producers of paper, titanium dioxide, catalysts and zeolites. By the third quarter of 1988, Alcoa-Coastal Chemicals will build two plants -- one in Houston and one in Tennessee, probably in New Johnsonville -- with combined capacity for more than 300 million lb/year. The partnership is aiming for annual sales of $70 million.

OLIN INCREASES TDI PRICE

Olin will hike its list price of TDI-80 toluene diisocyanate (TDI) by 8¢/lb to $1.14/lb in tank-car quantities and $1.21/lb for truckload drums, effective March, 19. In announcing the price increase, Olin also says that it is completing the engineering for expanding TDI capacity at Lake Charles, La.

The company estimates that capacity will be increased 25%, possibly by the end of 1989. This would be in addition to an expansion of more than 25% that Olin completed last August. Industry sources peg Olin's TDI capacity at about 200 million lb/year. Increased raw material and environmental costs, a strengthening of international TDI prices and demand, and a need for continued reinvestment in facilities are cited by Olin as reasons for the price increase.

STYRENE TABS MOVE UP

U.S. producer styrene prices on March 1 will range from 42¢-48¢/lb. Borg-Warner Chemicals is at the high end of the range, with its price rising 4¢/lb, to 50¢/lb, minus a 2¢/lb Temporary Voluntary Allowance (TVA). Sterling Chemical has chosen to retain its price of 43¢/lb, minus a 1¢/lb TVA. Fina Oil and Chemical has set a 46¢/lb price. Dow Chemical will increase its price to 50¢/lb, minus a 4¢/lb TVA.

El Paso and Arco reportedly also are quoting a net price of 46¢/lb. Huntsman and Chevron are said to have hiked prices 2¢/lb, to 48¢/lb, minus a 4¢/lb TVA.

News from Japan

Joint Venture Planned For Far Infrared Radiation Ceramics

Private business belonging to different types of industry have agreed to jointly establish a production/sales company for production of far-infrared radiation ceramics. They are Nippon Light Metal — a leading aluminum smelter-, C. Itoh — a big trading house—, Japan Vilene — a non-woven-fabric maker—, Seiyu — a topnotch retail company — and Dai-Ichi Kangyo Bank — Japan's top-ranking bank in terms of deposits.

The planned joint company (capital: Y250 million) will be set up immediately and President S. Mukoyama of Nippon Light Metal is due to concurrently assume the presidency of the new company. The joint company will commission Nippon Light Metal to produce the said ceramic powder.

Nippon Light Metal will remodel a ceramic-powder plant at its Kambara factory at a total cost of about Y100 million and put the revamped plant into commercial operation at the end of this year. Until then Nippon Ceram will produce the powder using its 2-t/m plant on a commission basis.

The new company will supply the product to producers of such primary materials as fibre, pulp, synthetic resin and rubber and, in addition, may process it by itself and market the resultant products in the form of end product.

The heat efficiency of far infrared radiation is higher than that of gas flames and hot air and far-infrared-radiation heaters have come to be used as the main types of equipment for drying plant film. It has recently been found that when applied to the human body, far infrared radiation encourages activation of tissues. On the basis of this finding, far infrared radiation has been increasingly applied to health care and maintenance of the freshness of perishables.

On the other hand, however, it is still not clear whether far infrared radiation can bring about desired effects. There is a move toward elucidating the effects of far infrared radiation at normal temperature and establishing standards for related products.

Far infrared radiation-emitting ceramics are expected to provide a large business field in the future. Nippon Telegraph and Telephone, Nippon Steel and Showa Denko are expected to join the company, heralding full-scale commercial use of far infrared radiation.

'87 Petrochemicals Output Up Due to Active Home Demand

Japan Petrochemical Industry Association recently issued a report on production of petrochemical products in 1987.

According to the report, ethylene registered 4,583,000 tons, the second largest figure in history next to the 4,780,000 tons of 1979. However, production of high-density polyethylene (HDPE), polypropyiene (PP), polystyrene (PS), styrene monomer (SM) vinyl chloride polymer (PVC), butadiene rubber (BR), benzene and xylene hit all-time highs because, in addition to brisk domestic demand, imports decreased due to the tight supply of petrochemical products throughout the world.

Production of ethylene was less than the 1979 result of 4,783,000 tons, but showed 7% rise over the previous year.

Regarding production of petrochemical derivatives, LDPE was 1,170,000 tons, less than 1979's result of 1,260,000 tons, but showed a 5% gain over the preceding year.

Production of the four major resins, viz., HDPE, PP, PS and PVC hit all-time highs. Their past records were: 840,000 tons for HDPE (1979); 1,330,000 tons for PP (1986), 850,000 tons for PS (1985) and 1,580,000 tons for PVC (1979).

Production of SM exceeded 1984's result of 1,420,000 tons, registering 1,540,000 tons; that of BR increased from 1984's result of 195,000 tons to 199,000 tons, that of benzene rose from the 1986 result of 2,280,000 tons to 2,420,000 tons; and that of xylene increased from the 1986 result of 1,580,000 tons to 1,770,000 tons, thus all hitting all-time highs.

Items decreasing from the previous year were; ethylene oxide (EO) with a decrease of 1% from the preceding year due to increased ethylene glycol (EG) imports; EG with a 9% drop from the preceding year; and SBR with a 2% decrease due to increased imports.

SDS Biotech To Built Tsukuba Agrochemical Lab.

SDS Biotech K. K. — jointly owned by Showa Denko and Sandoz (Switzerland) etc. — is scheduled to start constructing in July next year an agrochemical laboratory in Tsukuba, Ibaraki Prefecture at a total cost of Y2,000 million. The new lab will be inaugurated in July, 1990.

It will be staffed with about 60 members and small-scale, multipurpose synthesis equipment will be installed nearby. The company will move its existing research facilities to the new lab step by step.

The above move is aimed at beefing up the company's chemical synthesis and compound-screening capabilities and promoting co-operative research with the Sandoz group.

Sandoz, for its own part, envisages establishing research networks in Europe, the States and Japan in a bid to step up agrochemical operations throughout the world.

SDS Biotech deals in veterinary drugs, public-health products, industrial-use bactericides and agrochemicals as mainstay items. Its annual sales in the current business term ending next month will reach Y13,700 million.

With regard to agrochemical operations, it has installed synthesis/assessment facilities within Showa Denko's laboratory and is operating an agricultural experimental station in Ibaraki Prefecture.

'87 Output of Aniline, Phenol, Maleic Anhydride Hits Highs

Production of organic pigments, aniline, synthetic dyes and phthalic anhydride, etc., generally showed favourable results in 1987, according to the Japan Dyestuff Industry Association. In particular, aniline, synthetic phenol and maleic anhydride hit record highs. Production by item last year is as follows:

Synthetic dyes: The apparel fashion of black and deep colors continued last year as in the preceding year, pushing up production by 8% over the previous year. Reactive dyes surged 25% supported by the cotton boom and disperse dyes which had been in a poor business state started to increase contributing to an increase in the overall production of synthetic dyes. In terms of value, however, production remained almost at the same level as in the preceding year.

Organic Pigments: Production rose 7% mainly reflecting active demand for printing-ink use. Production of synthetic dyes. In plastic colouring increased over the preceding year. Despite the yen's sharp appreciation, exports showed a 9% rise due to strong demand in Southeast Asia.

Pigment resin colour bases: Production remained almost at the same level as in the preceding year. While use for textile-printing dyes in Japan was on a favourable level, exports dropped because of the yen's appreciation, offsetting an increase in domestic shipments.

Organic Rubber Chemicals: In the first half production was low, reflecting poor demand for use in automotive tires holding a share of a little more than 70% of the overall use, but in and after the summer this demand surged sharply, keeping total production at the preceding year's level.

Organic Photochemicals (hydroquinone and metol): Production suffered a 20% drop due to poor demand for black and white photoprinting.

Discharging agents: Production recorded 2-digit growth due to strong demand for use in pulp-and-paper making.

Aniline: Production hit an all-time high, supported by increases in MDI use — which holds about 70% of the total and other uses as well as exports to Southeast Asia.

Synthetic Phenol: Production also reached the highest record. This is due to increases in phenol-resin demand for use in electrical appliances and in bis-phenol.

Phthalic anhydride: Production recorded a gain due to increased use for plasticizers, unsaturated polyester and paints as well as favourable exports which came to a little more than 59,000 tons.

Maleic Anhydride: Production was the highest ever. The contributing factors were active demand for use in housing, construction materials and advanced composite materials, as in the case of phthalic anhydride. A large increase in succinic-acid demand for use in household bathing agents was also another contributing factor. Exports to Southeast Asia were on a favourable level.

Nippon Petrochemical to Expand Polyolefin Output

Nippon Petrochemicals Co., intends to establish a structure for producing and selling polyolefins at the rate of 300,000 tons a year as a goal to accompany the soon-to-be-completed polypropylene (PP) plant at its Kawasaki factory. The plant is being constructed by the company, Mitsui Petrochemical Industries, and Mitsui Toatsu Chemicals Inc.

The polyolefin industry has been designated as one of Japan's structurally depressed industries under the Temporary Measures Law for Structural Adjustment of Specific Industries. After the designation is removed at the end of June, the company's polyolefin production structure is to be expanded to 250,000 tons a year from 1989 because of the restarting of the

operation of its polyethylene plant and completion of the PP plant now under construction.

Regarding linear low-density polyethylene (L-LDPE), demand for which is expected to expand developing L-LDPE production further, the company is actively technology of its own and planning a new L-LDPE plant.

Since last year the company has been putting into force its "ARC (activation, restructuring and cost reduction) 100 Strategy" aimed at gaining recurring profits of more than Y10 billion, whatever the international economic environment surrounding Japan.

Toray Phillips Petroleum Co. Plans To Start Domestic Production of PAS

Toray Phillips Petroleum Co. has announced its plans to start the domestic production of polyacylene sulfide (PAS) a new engineering plastic. The company will set up a pilot plant within Toray Industries Tokai Plant (Aichi Prefecture) and start shipments of samples from this June.

PAS features ultra-thermal resistance with glass transition point (the larger the figure, the higher the heat resistance) 2-4 times higher than that of PPS (polyphenylene sulfide) resins and excellent chemical resistance. The product is expected to be used in composite airplane parts and PPS alloys. The company says that it will pursue new applications through sample shipments.

PAS was originally developed by Phillips Petroleum Co. in the United States. These are three grades, PAS-1, PAS-2, and PAS-3. Of these, PAS-2 will be produced in Japan. The remaining two grades are currently under development on a laboratory basis by Phillips Petroleum Co.

Unlike PPS, PAS-2 is a non-crystalline polymer. It has so far been learned from tests on the base polymer that its glass transition point is as high as 215°C (90°C in the case of PPS). It is believed in the United States that this product could be used as a matrix resin in combination with carbon fiber in aerospace applications.

Aerospace applications involve exposure to temperatures of 175°C, and the product shows less deterioration in its mechanical properties under such conditions. In addition to this, it has excellent chemical resistance because it belongs to the polymer family of PPS.

It is believed that the domestic production of PAS-2 will not require large-scale plant investment because of its close relationship with PPA and the manufacturer wants to promote the development of grades that meet the needs of consumers in Japan, where the development of new cars, electric and electronic parts are speedily under way. The company says that the production capacity of the plant totals dozens of tons.

The glass transition point of the resin is higher than that of polyether ether ketones, a new ultra heat-resistant engineering plastic. Thus, it is expected to be used in resins for thermoplastic, heat-resistant composite materials and as a substitute for fluororesin.

Toray Phillips Petroleum Co. is a joint-venture company set up by Toray Industries and Phillips Petroleum Co. in the United States and has recently started domestic production of PPS.

Shoden Starts Mass-Producing Nd Mother Alloy For Magnets

Showa Denko K. K. (Shoden) has begun mass production of a neodymium-iron mother alloy for magnets and is marketing it to magnet makers. Its production facilities were completed at its Chichibu factory last December.

The facilities are said to have a capacity of 3-4 tons a month. This is Shoden's second step in commercializing rare earth-based mother alloys for magnets, following start-up of production of samarium-based one last April.

Japanese demand for neodymium based magnets is predicted to double or triple this year over the preceding year and the company is thinking about additional capacity expansion within this year.

Shoden's neodymium-iron alloy contains 83.3% Nd and 13.9% Fe and is used as intermediate material for magnets. Magnet makers add boron to the alloy (called mother alloy) to an appropriate degree to obtain end products. The Shoden mother alloy is said to feature higher purity — the carbon content is reduced to 40 ppm and the oxygen content, 90 ppm.

Shoden receives raw-material neodymium from Nippon Rare Earths Co., a Japanese joint venture of Rhone-Poulenc (France) and Sumitomo Metal Mining Co.

Yearly sales of Shoden's metal products are worth nearly Y20 billion of which a little more than 60% is accounted for by ferrochromium metals. Shoden hopes that addition of the Nd mother alloy will push up its metal-product sales in the coming accounting year beginning in April to over Y 20 billion and bring the business of this line into the black for the first time in 3 years.

New Developments from Japan

Osaka Technology Station Develops New Bioceramics

Osaka Industrial Technology Experiment Station of Industrial Science and Technology Agency has developed bioceramics having a high density of nearly 100%. It sintered hydroxyapatite and partially stabilized Zirconia (PSZ), with the addition of a very small amount of calcium fluoride.

Hydroxyapatite, which has excellent biological affinity, is used for dental roots and bone fillers. Because of its weak intensity, however, it cannot be used for a part that must bear a heavy load. The station increased density and improved intensity and tenacity by making complex ceramics, with hydroxyapatite as base.

Bioceramics are used in making artificial bones, artificial dental roots and bone fillers, etc. They are expected to provide a promising market for fine ceramics because they have excellent biological affinity and do not liquate metallic elements.

At present two kinds of bioceramics — alumina and hydroxyapatite — are officially recognized by the Health and Welfare Ministry. Hydroxyapatite excels in biological affinity, but its intensity is only 20 kilograms per square millimeter. In contrast alumina has satisfactory intensity, but its biological affinity is somewhat inferior to that of hydroxyapatite.

Eisai Finds Phospholipid Improves Cerebral Activity

Eisai Co. has discovered that a certain phospholipid serves to extend the axis-cylinder process. Phospholipids have molecular weights which are much less than those of proteins, and thus the discovered substance may be able to enter the brain, whereas only some proteins have so far been known to have an action of stretching the axis-cylinder process but are too large to enter the brain.

The company says the substance may be used for developing an agent affecting the central nervous system for treating organic brain diseases such as after effects of cerebral apoplexy and senile dementia. It is preparing to carry out animal tests on it.

Yamanouchi To Run Clinical Tests on New Drugs in U.S

Yamanouchi Pharmaceutical Co. intends to develop drugs acceptable to the U.S market and conduct clinical tests there for itself — following similar activities in Europe — starting this April and apart from its joint drug R & D activities in the U.S. with Eli Lilly and Co. (US.) "We're considering offering two cardiovascular agents for the moment", says President Morioka.

Yamanouchi will soon send its R & D staff members to the US and will open an office there in furture. The decision stems partly from the fact that all of its drugs to be developed for and acceptable to the US market cannot be covered by the alliance with Eli Lilly.

In Europe, the Japanese drug firm started clinical tests for its drugs in London last autumn and will begin such tests in Frankfurt this April. Targeted drugs are amosulalol (antihypertensive), indeloxazine (a cerebral-circulation ameliorant), YM-09730 (calcium blocker) and YM-151 (Calcium .B-Blocker), etc. Amosulalol and YM-09730 are the drugs which will go into clinical tests in the U.S.

Meanwhile, the company will add this year YM-09151 (major tranquilizer) and YM-14673 (central-nervous-system agent for treating organic brain disease) to the drug list for clinical tests in Europe.

Farmitalia Plans to Step Up Drug Development in Japan

Farmitalia Carlo Erba S.r.l. (Italy) a subsidiary of Italian chemical giant Montedison — has announced a plan to invest a total of $ 60 million in the coming five years in its Japanese affiliate Farmitalia Carlo Erba K.K. This move is intended to promote development of new pharmaceuticals in Japan.

The Japanese company will increase the number of research staff members to 60 by the end of next year and that of detail men from the present 60 to 400 eight years hence and 600 ten years hence. It will scale up its drug-packaging facilities located in Kawasaki.

In a related development, it will tie up with Kyowa Hakko Kogyo Co for commodity development and sales promotion. Kyowa Hakko is scheduled to market the Italian company's products for 15 years from now on. The Italian company and its Japanese affiliate intend to beef up their development and marketing capabilities in partnership with Kyowa Hakko Kogyo.

The Japanese affiliate has applied to the Japanese authorities for production approval for an antitumor agent having wide-ranging efficacy. It has inaugura-

ted clinical tests for penem antibiotic (oral and shotpreparation uses) a cholesterol-reducing agent and an inhibitor agent for blood-platelet agglutination. In addition, it envisages starting development of rifamycin derivatives.

Mitsubishi Electric To Establish Full-Scale R&D Center in U.S.

Mitsubishi Electric Corporation has firmed up a plan to establish a full-scale research institute in the U.S., as part of measures for strengthening its R&D structure. According to the plan, this research institute is to become a base for the development of computers, communications software and systems, in which development this company has been left behind by its rivals.

During next fiscal year the new research institute will start activities, including the securing of engineers, following the completion of its buildings. As the site for this institute, Durham, North Carolina will be selected. This is the first case of establishment of a full-scale R&D center in the U.S. by a major Japanese electric-machinery manufacturer.

The move, which has been started by Mitsubishi Electric at a time when Japan-U.S. technological exchange is rushing forward, deserves special attention, because it indicates the direction to be followed by R & D structures hereafter.

Mitsubishi Electric has nine research institutes, in Japan, beginning with its Central Research Institute. It maintains a research Institute. It maintains a research structure covering both materials and systems. Two of the nine research institutes, or the Information and Electronics Research Institute and the Communications System Technology Development Center, are engaged in the development of communications systems, beginning with computer software.

The company, which has been growing with production of heavy electric machinery as its main business, has been left far behind manufacturers of communications equipment and computers — such as Hitachi, Nippon Electric and Fujitsu — in the field of information processing centered on computers and manufacturing of communications equipment and systems operating on a wire basis. However, it has begun to change its management strategy for switchover to a policy laying major emphasis on information and communications, along with the development of electronic equipment and the advent of the age of full-scale combination of computers and communications.

As part of this switchover, it is necessary for the company to establish measures which will strengthen its R & D sector for expansion of computer software, systems and communications systems. The company thinks that it should also secure and foster system engineers, who constitute an important part of this sector, on a world-wide level. From this standpoint, it has decided to strengthen its R&D structure in the U.S. which is leading the world in the field of software technology, in order to step up system development in accordance with the needs of the world.

In the U.S., Mitsubishi Electric has established sectors connected with development projects, such as its technical service sector and its semiconductor design center. According to the new plan, it is to establish a full-scale R&D sector, with medium and long term prospects for the future. This plan deserves special attention as a new undertaking including Japan U.S. technological exchange. Mitsubishi Electric is planning to build a full-scale research institute in North Carolina, the U.S. in fiscal 1988 at earliest.

M 'Bishi P' Chemical To sell Fungicide in Taiwan

Mitsubishi Petrochemical Company, Ltd., will branch out into the Taiwanese market to sell a fungicide (thiabendazol wettable powder; brand name : Panmush) for control of poisonous fungi on edible mushrooms.

The fungicide is an agrochemical which controls only poisonous fungi such as trichoderma without checking growth of mycelia and occurrence of edible mushrooms.

The company recently filed an application for permission to have the fungicide registered with the Taiwanese government and the application is expected to be approved this summer, if all goes well.

In Taiwan, since "shitake" (a type of mushroom) are used in Chinese dishes cooking in large quantities, culture of thus mushroom is increasing year by year.

The company will sell the fungicide mainly for "shiitake" culture in Taiwan and intends to sell it in the future to China and Korea where "Shiitake" are being consumed in large quantities.

News About New Projects

SAUDI ARABIA STUDIES NEW AMMONIA PLANT AT JUBAIL

Saudi Arabia plans to build a new world-scale, export-oriented ammonia plant at Al Jubail, Saudi sources have confirmed that Petrokemya, Sabic's wholly-owned subsidiary, has been evaluating the feasibility of an ammonia plant.

The study, which has been under way for two months, is due for completion in June of this year. Two options are under consideration --one involving a 1,500 ton/day plant based on off-gases feedstock, the other a conventional ammonia unit of the same capacity.

Using off-gases from ethylene methanol and refinery units, the first would be built for Petrokemya, which would supply the feedstock. A conventional natural gas based plant would be constructed for the National Chemical Fertilizer Co (Ibn Al-Baytar), a Sabic-Safco fertilizer joint venture.

Ibn Al-Baytar is the owner of Saudi Arabia's newest ammonia plant. Built by Toyo Engineering of Japan, the 500,000 ton/year plant has been in operation since August 1987 supplying product to the international market.

When new donwnstream fertilizer plants are built for Ibn-Al-Baytar, most of the ammonia will be committed.

Intent on keeping its share of the ammonia export market, Sabic has embarked on the latest plan. Should a decision to go ahead be taken, the plant could be on stream within 26-28 months, sources say. Ibn Al-Baytar meanwhile has definitely decided to go ahead with a new 1,500 ton/day urea plant in the first phase of its downstream investment. Other units will produce 1,500 ton/day of NPKs, 850 ton/day of triple super phosphate, and 30 ton/day of liquid NP fertilizers.

It is understood that four groups are now competing for the $250m project to build the urea and fertilizer units. They are Chiyoda, Uhde, Hitachi and Technipetrol. Dragados, Spie Batignolles and Toyo are no longer in the running.

The first three are proposing the Stamicarbon urea and CdF Chimie fertilizer processes while Technipetrol is bidding with the Snamprogetti urea and Cross NPK technologies. A decision is due during March. Potash and phosphate raw materials will be bought on the world market.

VINAMUL EXPANDS EMULSIONS CAPACITY

The Vinamul Group is installing additional reactors at its factory in Warrington, UK. The £3m investment will increase Vinamul's capacity to manufature speciality polymer emulsions by at least 10,000 ton/-year to approximately 100,000 ton/-year.

The project will enable the company to broaden its range of higher performance products, including vinyl acetate and acrylic homopolymers and copolymers, to meet its growing customer demand in adhesives, building, paint, paper and textile industry applications.

The new plant includes additional raw materials handling and product storage and despatch facilities, the raw materials are various acrylic monomers and vinyl acetate which the company buys from UK and other European sources.

The plant will come on stream during the second quarter of this year, raising Vinamul's range of emulsions.

KTI/TECHNIP JOIN RACE FOR FINANESTE

A fourth group has entered the race to build Western Europe's newest ethylene cracker at Antwerp in Belgium. Finaneste, the 65-35 joint venture between Petrofina and Neste which is investing in the BF20bn ($573m) complex, has invited the KTI/Technip group of the Netherlands and France, respectively to submit a proposal for the project.

KTI and Technip join the three contractors -- MW Kellogg, Lummus Crest and Stone & Webster -- which were invited earlier, following feasibility studies.

To be built on the left bank of the Scheldt river, the new complex, the first grass-root ethylene plant in Western Europe since Mossmorran and possibly the last this century, will have an actual capacity of 442,500 ton/year of ethylene (name plate capacity 450,000 ton/year). Propylene yields will depend on the technology used.

It will be designed to crack mainly naphtha although in the future 50% of capacity could be fed on propane and 20% on atmospheric gas oil.

Downstream units have not been fixed yet. To begin with, the C_4 cut will probably go to another butadiene extraction facility and aromatics stream for benzene extraction within Petrochim's facilities. In December KTI, now a Mannesmann subsidiary, was awarded a a contract to instal a

new furnace within Finaneste's No. 2 cracker. The GKV KTI furnace has a throughput of 16 ton/hour of naphtha and will raise capacity of the existing plant by about 50,000 ton/-year of ethylene. Total Finaneste ethylene capacity will increase to 1m ton/year.

The service contract, which will include basic and detailed engineering, procurement assistance and supervision of construction and start up, is due to be awarded in Early April, for completion in Early 1991.

HOECHST PP PLAN

Hoechst has announced plans to spend DM70m ($41.38m) on a 50% expansion of capacity at its Neunkirchen, West Germany, polypropylene films plant to 45,000 ton/year. The new capacity is expected on stream by mid-1989. The group points to a continuously expanding market for biaxially oriented PP film (BOPP) which it sells under its *trespaphan* trademark. The films are currently profiting from double-digit growth rates in Europe, Hoechst says.

A 50% expansion in mid 1986 to the current 30,000 ton/year was taken up by the market in a short time, but supply is still tight, Hoechst says.

SIMON WINS HUNGARIAN ACRYLIC FIBRES CONTRACT

Simon-Carves Ltd. of the UK, a Simon Engineering group company, has been awarded a contract by Chemokomplex, for the engineering and equipment supply for a 20,000 ton/year acrylic fibre plant to be built at the Magyar Viscosagyar facility in Nyergesujfalu, Hungary. The contract is valued at approximately £13m ($22.6m).

The plant will utilize Du Pont process technology and will incorporate some equipment from Du Pont's *Orlon* facility at Maydown, Northern Ireland, supplemented by new equipment supplied principally from UK sources.

The Du Pont plant was originally designed to produce 45,000 ton/-year. It consisted of two lines but one has already been sold to an Indian customer. Originally built in 1968, the plant was closed down in 1980 when it was making heavy losses because of major overcapacity in Europe.

The acrylic fibre produced will be used within Hungary and also exported to other Comecon countries. The plant is due to come on stream early in 1990.

Three groups competed for the order. Chemtex and Mitsubishi Corporation were offering the American Cyanamid process and Kawasaki Heavy Industries and Toyo Menka were proposing the Exlan process.

Following a tour of operating Du Pont facilities the client was apparently very impressed with the quality of the fibre produced.

The plant is being sold under a novel leasing arrangement whereby the Budapest-based Central European International Bank (CIB) is the real owner. CIB, which is a consortium of banks, including the National Bank of Hungary and five overseas banks (Japanese and European), has an offshore licence which means it can operate in foreign currency more freely. The leasing arrangement is between Chemokomplex and the CIB

Although 20 years old. the plant is apparently in good condition and has plenty of life left. Du Pont's similar plants in the US have been running for 30 years and, with good maintenance, have operated satisfactorily. Simon Carves declined to reveal how much Du Pont charged for the plant.

The deal does not involve buy back in fibres but Simon-Carves did sign an agreement to use Hungarian services and equipment over the next three years.

Magyar Viscosagyar's existing acrylic fibres facilities are designed to produce 6,000 ton/year of staple and 8,000 ton/year of filament. Acrylonitrile feedstock is purchased from the Soviet Union.

AGA AND HOEK LOOS IN DUTCH INVESTMENT

Aga and Hoek Loos, respectively the Swedish and Dutch industrial gases groups, are to invest Dfl.24m ($12.6m) in a new plant for the purification and liquefaction of carbon dioxide.

The 100,000 ton/year plant will be built at Rozenburg, near Rotterdam by November 1989. Raw carbon dioxide for the plant will be supplied from an ammonia plant owned by Kemira BV, a Dutch subsidiary of the Kemira group of Finland.

The plant will be managed by VOF Cryoton, a Dutch gas production joint venture set up by Aga and Hoek Loos. It will be run by Kemira's personnel. Cryoton also operates an air separation plant in Botlek.

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* Croda International has acquired the chemicals division of John Kerr from Ginge-Kerr for £981,000. The division manufactures and sells foam and power products for use in fire fighting and building materials. The protein-based foams are complementary to the proteins produced by Croda's Colloids division.

HOC to make polyurethanes

A Rs. 90 crores project to produce 10,000 tonnes MDI (4-4' Diphenyl Methane Di-Isocyanate) and 10,000 tonnes of Rigid polyurethane is being planned by the Hindustan Organic Chemicals Ltd., a public sector undertaking. In addition to this, HOC is also planning to put a Rs. 60 crores plant of flexible polyurethanes. Search for a suitable technical collaborator is already on. This was announced at a Press Conference at Bombay on 31st March, by the HOC Chairman and Managing Director Mr. V. Krishnamoorthy.

HOC has achieved commendable performance during the year 1987-88 both in the production and sales of its products. Exports have also been satisfactory. The following is a brief summary of the progress report of HOC :

Production for the year was 1,47,136 tonnes compared to 1,35,200 tonnes in the previous year out of which production of Phenol and Acetone at Cochin was 8,375 tonnes and 5,200 tonnes respectively. Production exceeded the rated capacities in respect of a number of plants like Acetanilide (157 per cent), Nitrochlorobenzenes (124 per cent), Formaldehyde (123 per cent), Dinitrobenzene (115 per cent) and Chlorobenzenes (109 per cent).

SALES

Net sales during the year were Rs. 125 crores as against Rs. 85 crores last year registering a 47 per cent rise. At Rasayani, the increase was 14 per cent which was achieved by offering attractive terms to the customers and better product mix. The Cochin unit accounted for Rs. 28 crores of sales, and it is a matter of pride that the quality of both Phenol and Acetone produced in this unit is comparable to the best in the world.

EXPORTS

Achievement on the export front was spectacular. The value of exports soared to Rs. 650 lakhs compared to Rs. 453 lakhs in the previous year registering an impressive 43.5 per cent increase. The company has earned a name in the international chemical market for its high quality products. Some of the important products exported were Meta Amino Phenol, Nitrobenzene, Nitrotoluenes, Nitrochlorobenzenes and a number of value added products based on HOC's products.

Also HOC's products were supplied at concessional prices to the domestic parties for conversion and export to the extent of Rs. 375 lakhs. This has enabled the country to earn foreign exchange to the tune of Rs. 20 crores.

PROFIT

The estimated operating profit before depreciation and interest is Rs. 2567 lakhs compared to Rs. 2051 lakhs last year. The net profit after depreciation and interest is estimated at Rs. 950 lakhs as against Rs. 852 lakhs last year registering an increase of 11.5 per cent. It is heartening to note that the Cochin unit, after commencement of regular commercial production, has also contributed its share to the above profit.

NEW PROJECTS

PHENOL

The Phenol Project at Cochin has been successfully commissioned and commercial production of Phenol and Acetone has already commenced. The capacity achieved during guarantee runs was 110 per cent.

PTFE

HOC's subsidiary, Hindustan Fluorocarbons Ltd. has also commissioned its PTFE plant at Medak in Andhra Pradesh for production of 500 tonnes per annum. HFL has so far produced about 50 tonnes of different grades of HIFLON (PTFE) of good quality and the same has been received well in the market. The company has taken various steps including setting up of an application centre and offering guidance to existing and potential entrepreneurs. Also, HOC itself proposes to set up facilities for isostatic moulding and paste extrusion at a cost of Rs. 2.50 crores. This will be set up during 1988-89.

FUTURE PROJECTS

HOC has also plans to erect a new formaldehyde plant of 30,000 tonnes per annum capacity using the latest technology with improved catalyst. This is likely to cost around Rs. 8 crores. Commercial and technical discussions with process licensors are under way. As a part of its diversification programme, HOC will also set up in collaboration with Gujarat Industrial Investment Corporation a plant for manufacture of 15,000 tonnes per annum of Cyclohexanone/ Cyclohexanol.

Research & Development

The R&D Deptt. is pursuing its efforts in the following areas:

— Stabilising and improving the operation of the pilot plants

set up for production of Butenediol and Cyclohexylamine.

— Development of noble metal catalysts for increased manufacture of Cyclohexylamine.

— Besides the in-situ regeneration of Aniline catalyst which is saving an amount of Rs. 45 lakhs per annum in foreign exchange, old discarded Aniline catalyst was also rejuvenated resulting in additional saving of Rs. 30 lakhs.

Pollution Control

The company has already installed effective pollution control systems which ensure proper treatment of its effluent and enable the discharge of the treated effluents in the saline water zone in the creek approved by the Maharashtra Water Pollution Control Board. A pilot biodegradation plant was set up in 1986-87 for biological treatment of liquid effluents which has given highly satisfactory results. Based on this, a full scale Biodegra dation plant is being set up.

The fine performance during the year 1987-88 augurs well for the coming year 1988-89 when HOC hopes to achieve much higher levels of production, sales and profit.

GIIC, SMS UDYOG TIE UP: GUJ FLOUROCHEMICALS SET UP

Gujarat Industrial Investment Corporation (GIIC) has joined hands with SMS Udyog Private Limited, a subsidiary of Industrial Oxygen Company Private Limited, and one of the leading industrial gases manufacturers in the country in setting up a most modern plant for the manufacture of 5000 TPA, of refrigerant gases and 2200 tpa of anhydrous hydrofluoric acid.

A shareholders agreement has been signed between Mr. S. K. Shelat, managing director of GIIC and Mr. V. K. Jain, managing director of the proposed company registered under the name and style of Gujarat Flourochemicals Limited.

The proposed plant will have know-how arrangements with world leaders in the manufacture of refrigerant gases and hydroflouric acid, Pennwalt Corporation, US and Stauffer Chemicals Inc., USA. The plant proposed to be located in a backward district, will start production in early 1989.

Meanwhile, GIIC has sanctioned financial assistance worth Rs. 689 lakhs to eight industrial units. Among them, Rs. 200 lakhs has been sanctioned for a cement project as an interest free loan.

The remaining units include three units for the setting up of a sizing plant at Ankleshwar and Silvassa. One unit would be ma nufacturing printed circuit boards at Gandhinagar and the second unit would be manufacturing ampicillin, arexycillin and sodium cloxacillin.

The projects envisaged shall generate direct employment for 1,400 people and shall catalyse investment of Rs. 7.589 lakhs.

CAMPHOR & ALLIED

Camphor and Allied Products has reported improved working results for 1987. The turnover during the year has been up by 11 per cent from Rs. 20.09 crores in 1986 to Rs. 22.24 crores and the gross profit from Rs. 213.49 lakhs to Rs. 234.40 lakhs.

After providing Rs. 76.02 lakhs (Rs. 82.25 lakhs) for depreciation, nil (Rs. 14 lakhs) for investment allowance reserve, Rs. 67 lakhs (Rs. 50 lakhs) for taxation, and after some adjustments, there is a surplus of Rs. 75.60 lakhs against Rs. 65.84 lakhs in the previous year. The company has maintained the equity dividend at 18 per cent, absorbing Rs. 46.82 lakhs (same). A sum of Rs. 6 lakhs (Rs. 5 lakhs) is transferred to general reserve No. 2 and Rs. 22.70 lakhs (Rs. 14 lakhs) to general reserve No. 1.

The production of camphor during the year was lower compared to the previous year due to the normal maintenance and shut down of the plant, during which period the balancing equipment for achieving production capacity of 2,000 tonnes was installed. Due to the drought conditions, the company was compelled to cut down the production of fenvalerate. Production of menthol was also curtailed due to uneconomic prices as market continued to remain depressed for the third consecutive year.

As per the terms of the issue, the company has redeemed further 1400 — 12 per cent secured debentures of Rs. 1,000 each on April 1, 1987. During the year, the company has bought back and cancelled further 193, 15 per cent non-convertibe secured debentures of Rs. 100 each bringing the total of debentures so far bought back to 556.

Technological Scene Abroad

AN ENGINEERED MICROBE IS MONITORED IN SOIL

The ability to track and monitor genetically engineered microorganisms that are released into the environment has been successfully demonstrated by researchers at Clemson University (Clemson, S.C.). In November, microbiologist Ellis Kline began field-testing the soil bacterium *Pseudomonas fluorescens* that Monsanto (St. Louis) engineered to determine its distribution and survival in soil. In the test, rows of wheat inoculated with *P. fluorescens* were planted adjacent to rows of noninoculated wheat. Extensive monitoring during the first 10 weeks of the test indicates that the bacteria successfully colonized the roots of the inoculated wheat plants and remained resricted to the area of planting, says Kline, adding that bacteria did not cross over to roots of noninoculated plants. Monsanto engineered *P.fluorescens* to metabolise the sugar lactose, which the bacterium normally cannot utilize. The organism also contains markers for fluorescence, color and resistance to the antibiotic rifampin. That provides a way to identify the organism among the multitude of native bacteria found in the soil, says Monsanto. The company adds that researchers can detect as little as one engineered *P. fluorescens* out of 1 billion organisms. The 18-month field test is part of a $607,000 research contract that was signed in June 1987 by Clemson and Monsanto.

FUNGUS SELECTIVELY KNOCKS OUT JIMSONWEED

Jimsonweed is an invasive weed that competes with soybeans and cotton, and contains alkaloids that can harm livestock and humans. Moreover, once jimsonweed matures, it stubbornly resists control by many currently used herbicides. But now the fungus *Alternaria crassa* has been found to kill jimsonweed but not crops, including soybeans and cotton, reports Clyde D. Boyette of the U.S. Department of Agriculture's Delta States Research Center (Stoneville, Miss.). The fungus -- in the form of dormant spores -- can be spread over vegetation several ways: in granules, gel pellets and water-based and oil-based liquid sprays.

A CHEMICAL ROUTE TO PURER RAW SUGAR

Mazer Chemicals (Gurnee, Ill.), a producer of sugar processing chemicals, says it has developed a chemical process that results in high yields and higher-than-average-quality raw sugar, which it calls very low color crystal (VLCC) sugar. Mazer does not specify how its process works, but says it "employs a chemical clarification system where decolorization and removal of non-sugar solids takes place." Most cane sugar mills use a combination of mechanical processes and chemical additives to produce more sugar and better quality sugar, says Mazer. Unlike some other sugar-processing methods, Mazer's process avoids the use of sulfur.

A NEW ENTRY IN SUPER-CRITICAL EXTRACTION

A new company, Supercritical Processing is setting up shop to offer services in supercritical extraction at Allentown, Pa., after buying the assets of a similar venture operated by Air Products and Chemicals. The new president, Zvi H. Weinman, says that the company has completed research and development, laboratory and pilot plant facilities. It is offering contract R&D services, as well as small-scale manufacture and toll-processing services.

HAZARDOUS WASTE SITE CLEANUP

A new company, Bioprocess Engineering (Wilmington, Del) has been formed to engineer biological systems to clean up hazardous waste sites. The new company offers turnkey packages incorporating biological cleanup methods for complex hazardous materials sites, says President Alan Rozich.

Bioprocess Engineering also will provide operating services for existing treatment plants, particularly those that handle materials that are toxic or are difficult to degrade.

DESULFURIZATION OF FLUE GAS FOR CHINA

China will get two flue-gas desulfurization plants in 1990. Mitsubishi Heavy Industries (MHI), Tokyo, will build the units for Huaneng International Power Development (Beijing). The plants will be installed on two 350-megawatt coal-fired boilers at the Luohuang power station in Chongging, Sichuan province. Each plant will be designed to remove SOx from 1,060,000 cu.m./hr of flue gas. Sulfur oxides will be removed by MHI's lime treatment process, which makes gypsum as a byproduct.

GAS-RELEASE MODELING ON A PERSONAL COMPUTER

A model that predicts what happens to the vapor cloud that forms when dense gases -- such as liquefied natural gas, liquefied petroleum gas, ammonia and chlorine --escape is now available from Trinity Consultants (Richardson, Texas).

Environment

BRUSSELS UNVEILS CFC CONTROL PROVISIONS

Officials at the European commission are hoping that environment ministers will adopt a proposal on chlorofluorocarbons next month to bring Europe in line with the Montreal protocol and Vienna convention. The commission is proposing a timetable for community signature and ratification of these two international agreements and the text for a regulation which would apply direct controls on the community's producers and importers.

While the commission hopes that the meeting of environment ministers on March 21 will adopt the provisions, insiders predict that a final decision is unlikely to be made until the end of June. One likely area of conflict is the system of controlling CFC production at source rather than by country.

"The comission's approach is to control supply rather than demand," an EEC spokesman said. To achieve this the commission plans to introduce import controls from outside the community and impose controls on individual companies within the EEC.

Under the terms of the proposal each producer will be able to calculate exactly how much it will make, sell and use itself. By limiting supply in this way, the commission believes consumption will be regulated as it will make no difference what the end use of the chemicals is.

Production of CFCs in Western Europe totalled 438,000 ton in 1986 with about a third being exported out of the community. The commission is also proposing quantitative limits on imports; 791 ton in the last six months of 1989; 1,582 ton/year from 1990 to June 1993; 1,266 ton/year from July 1993 to June 1998; and 791 ton from July 1998 to June 1999.

The commission is also hoping to get community support for both the Vienna convention and the Montreal protocol. The commission wants all member states to sign and ratify the convention by September 15 this year. Spain, Portugal and Eire are the only member states still to sign and ratify the convention which accepts the principles of reducing CFCs.

Eire and Spain are the only two EEC member states still to approve the Montreal protocol. This protocol is due to enter into force by January 1, 1989 as long as 20 countries ratify the convention by October 1, 1988. Once in force the protocol will impose a freeze on consumption and production at 1986 levels from July 1989. This freeze will be followed by a 20% cut in 1992 and a further 30% reduction in 1998.

EEC COMPROMISE ON BENZENE PROPOSAL

The European Commission has unveiled its modified version of a draft directive to protect workers from benzene exposure. The commission hopes the new version will allow member states to find a common position. The original version fell at last December's meeting of the social affairs council when the Italian delegation refused to support it.

Initially the commission was proposing a threshold limit of 1ppm but the council presidency proposed a compromise threshold of 2ppm from July 1992, followed by a reduction of 1.5ppm by January 1995. This compromise meant that the whole directive was in danger of being lost as it has already been accepted by the European parliament. The commission has now redrawn the draft and explained the position to the parliament.

TESSENDERLOO INCINERATION BAN

Belgium's Tessenderloo Chemie has been ordered to cease incinerating chlorinated hydrocarbons. After complaints from Belt, the Belgian environmentalist pressure movement, Jan Lenssens, the Flemish miniser of the environment investigated the allegations and concluded that the Belgian firm does not have a licence to incinerate anyway.

The management of Tessenderloo Chemie claims that the regulations are so unclear that they cause confusion. The company maintains that it is following all safety and environment procedures by burning waste at temperatures about 1100°C.

BELGIUM CONDEMNED ON WASTE DISPOSAL

Belgium has been called into line for the second time in six years for failing to implement EEC directives concerning waste from the titanium dioxide industry, waste in general, the disposal of used oils and the disposal of other substances. The European court of justice upheld a claim from the European commission that Belgium is still not fully complying with the directives. The Belgian Government has now informed the commission that two of the country's three regional authorities, Walloon and Flanders, are now in the process of implementing the legislation.

Quick Seal

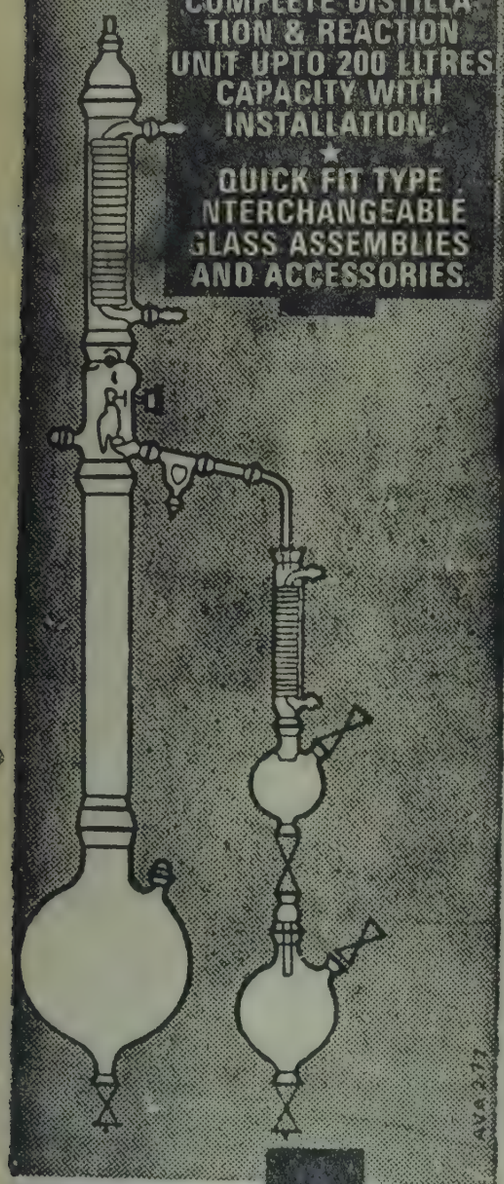
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MARKET INFORMATION

We cannot guarantee the accuracy of the prices published in CHEMICAL WEEKLY as they are based only on the enquiries made by our correspondent — and, as such they are not FIRM PRICES as between a buyer and seller. The prices are published only with a view to giving some ideas of market conditions.

The prices are inclusive of Excise and Maharashtra Sales Tax.

Chemicals Better

With the withdrawal of transport strike and the announcement of a soft import policy, the Bombay chemicals and dyes market reacted favourably. Most of the items ruled steady with good off-take.

Melamine which was ruling at Rs. 61 came down to Rs. 54. However Rangolite (Czech.) shot upto Rs. 50, Carbon tetrachloride moved up to Rs. 13. Titanium dioxide, caustic and soda ash were normal. Amongst dye intermediates, MPD of Japan spurted to Rs. 165 followed by J. Acid to Rs. 272. Other items were normal.

(Prices as on 29th March 1988)

INDUSTRIAL CHEMICALS	Per kg.
Ammonium sulphate	2.00
Ammonium phosphate (Mono)	14.50
Ammonium phosphate (Di)	12.00
Ammonium carbonate (Di)	17.00
Ammonium bicarbonate	4.75
Ammonium chloride	3.00
Ammonium nitrate	3.50
Arsenic white powder	21.00
Acrylamide (Resale)	59.00
Barium carbonate	6.00
Bleaching powder (33% Cl)	3.80
Borax (Granular)	15.00
Borax (Powder)	15.50
Boric acid (Tech.)	21.00
Bisphenol-A	47+ST
Butyl carbitol	35.00
Caustic soda (Flakes)	8.00
Caustic soda (Solid)	7.60
Caustic soda (Lye)	6.00
Calcium chloride 70% (solid)	3.25
Calcium chloride 75-80% (fused)	3.50
Calcium chloride 36% (Anhydrous)	5.00
Calcium Carbonate PPT	3.00
Calcium carbonate (Activated)	3.55
Camphor (Indian)	82.00
Cresylic acid	50.00
Cream of Tartar (Tech.)	64.00
Citric acid (Belgium) (Resale)	46.00
Citric acid (Indian) (Resale)	44.50
Copper sulphate	17.50
Chromic acid	50.00
Cyanuric chloride	120.00
Cobalt oxide	280.00
Carbitol	51+ST

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Factory: Plot No. K-30, MIDC, Tarapur, Maharashtra.

Dicalcium phosphate (Anhydrous)	16.00
Ferric chloride (Lumps)	6.50
Ethylene urea	56.00
Glue flakes	8.45
Glue sheets	6.75
Gohsenol GH-17	80+ST
Hydro	31+ST
Hyflosupercell	18.50+ST
Hexamine	29.00
Industrial Wax	25.00
Litharge	15.00
Lead Acetate (Tech.)	28.50
Lithopone	15+ST
Magnesium chloride (crystal)	2.00
Menthol crystal (Flakes)	185+Ex.+ST
Menthol bold	205+Ex.+ST
Menthol crystal bold	245+Ex.+ST
Magnesium carbonate (Japan)	16.00
Magnesium carbonate (Indian)	15.00
Maleic Anhydride (per kg)	38+ST
Mercury (75 lbs.)	9,000.00
Nickel chloride	90.00
Oxalic acid (Resale)	20.00
Peppermint oil (Rectified)	90+Ex.+ST
Potassium carbonate (indian)	19.00
Potassium carbonate (Imported)	21.00
Potassium bichromate	22.00
Potassium phosphate (Mono)	14.00
Potassium phosphate (Di)	14.00
Polyvinyl alcohol (No. 117)	88.00
Polyvinyl alcohol (No. 173) (Resale)	92.00
Polyvinyl alcohol (No. 208)	78.50+ST
Paraformaldehyde (Resale)	18.00
Phthalic anhydride 96%	23.25
Pentaerythritol (Resale)	51.50
Paraffin wax (Resale)	14.50
Rangolite (German)	70.00
Rangolite (Czech.)	50.00
Sodium sulphate (Fine)	4.00
Sodium sulphate (Coarse)	3.80
Sodium sulphide 50-52% (Flakes)	8.00
Sodium sulphide 58-60% (Flakes)	9.00
Sodium sulphide pure (Flakes)	12.25
Sodium nitrite	17.00
Sodium chlorite 80% (Spain)	92.00
Sodium chloride 50% (Spain)	81.00
Santobrite (Indian)	36.00
Soda Ash (Tata)	4.00
Soda Ash (Birla)	3.80
Soda Ash (Imp.)	3.50
Sodium bicarbonate	5.25
Sodium bisulphite	4.50
Sodium silicate	3.00
Sodium acetate	6.00
Sodium alginate	120+ST
Titanium Dioxide (Anatase)	51+ST
Titanium Dioxide (Rutile — RCR_2)	70+ST
Tartaric acid (Crystal)	94.00
Trisodium phosphate	4.80
Thiourea	70+ST
Urea (Tech)	2.75
Vacuum salt	1.00
Zinc Dust	30.00
Zinc Oxide	30.00
Zinc chloride powder (technical)	14.00
Zinc sulphate	4.00

SOLVENTS		Per kg.
Acetic Acid (Glacial)	(Resale)	14.00
Acetic Anhydride	(Resale)	30.00
Acetone	(Resale)	17.00
Adipic Acid		51+ST
Aceto Acetanilide		50.00
Aniline Oil	(Resale)	42.00
Benzoate Plasticiser		33.00
Butyl Acetate		36.00
Butyl acrylate		115+ST
Butyl stearate		36.00
Butanol	(Resale)	35.00
Benzyl chloride		24.00
Benzo trichloride		16.00
Benzoyl chloride		22.00
Benzyl alcohol (FRC)		36.00
Bromine Liquid		42.50
Chloroform		24.50
Carbon Tetrachloride		13.00
Cellosolve		47.00
Cyclohexanone		44+ST
Cyclohexanol		43.00
Diacetone	(Resale)	35.00
Diethyl Oxalate		34.00
Diethylene glycol (DEG)		37+ST
Dioctyl Phthalate		52.00
Diallyl Phthalate		56.00
Dimethyl Phthalate		28.00
Dioctyl Adipate		52.00
Dibutyl Adipate		42.00
Dipentene		15.00
Dimethylamine 40%		12.00
Dimethylamine 60%		14.00
Ethyl Acetate		24.00
Ethyl Acrylate		46.00
Ethylene Dichloride		11.00
Ethylene Glycol		23.25
Formic Acid (Imp.)	(Resale)	28.00
Formaldehyde	(Resale)	7.00
Glycerine (CP)		50.00
Glycerine (IW)		49.00
Hydrogen peroxide 50%	(Resale)	32.00
Isopropyl Alcohol		19.50
Iso Butyl Alcohol		28.00
Monoethanolamine	(Resale)	47.00
Melamine		54+ST
Morpholine (Indian)		65.00
Methyl Ethyl Ketone		44.00
Methyl Isobutyl Ketone		36.00
Methyl Acrylate		42.00
Methyl Dichloride	(Resale)	26.00
Meta Cresol		45.00

AVAILABLE AT COMPETITIVE PRICE WITH 5% EXCISE GATE PASS :

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DI OCTYL PHTHALATE

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SORBITOL	METHANOL
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GLYCERINE	XYLENE
PHENOL	ACETONE
I. P. A.	FORMALDEHYDE
HYDROGEN PEROXIDE	PARAFORMALDEHYDE
TITANIUM DIOXIDE	ETHYL ACETATE
M. E. K.	n-BUTANOL
CYCLOHEXANONE	CALCIUM CARBONATE

Please Contact :

RAM SHREE CHEMICALS

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Telephone : 329976/333475

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DIETHYL CARBAMAZINE CITRATE I.P.	
NIFEDIPINE U.S.P.	ORTHO NITRO BENZALDEHYDE
THEOPHYLLINE ANHYDROUS I.P.	
WHITE/YELLOW SOFT PARAFFIN I.P.	a-PICOLINIC ACID

Please contact manufacturers :

Trichem Laboratories

11, Lalwani Industrial Estate,
14, G. D. Ambekar Marg, Wadala,
BOMBAY-400 031.
Phone: 4123188/4127568

Anmuk Rasaayan

5 Mody Chambers 319/21 Narsi Natha St Bombay 400 009 Ph : 321063 5131809/347255 Gram: ALLUNITE

2, 4 Di Chloro Benzoic Acid	Molybdic Acid
2 Amino 6 Methyl Pyridine	Potassium Bromide
2 Amino Pyridine	Sodium Bromide
Antimony Potassium Tartrate	Sodium Potassium Tartrate
Ammonium Molybdate	Sodium Molybdate

Nitrobenzene	17.00
Nitric Acid (Con.) (RCF)	2.50
Ortho Cresol	31+ST
Phenol	30.50
Propylene Glycol	34.00
Polyethylene Glycol (No. 200)	40.00
Polyethylene Glycol (No. 400)	43+ST
Polyethylene Glycol (No. 500)	42.00
Polyethylene Glycol (No. 1600)	14.00
Polyethyene Glycol (No. 4000)	38.00
Polyethylene Glycol (6000)	50.00
Para Cresol	40.00
Styrene monomer	37+ST
Sorbitol	18.50
Sulphuric Acid	2.10
Trichloroethylene	28.00
Triethanolamine (Resale)	42.00
Turpentine Oil (Germany)	8.00
Turkey Red Oil (50%)	11.75
Triethylamine	50.00
Vinyl Acetate Monomer	42.00

SOLVENTS	Per Litre
Benzene	10.75
N-Heptane	8.00
N-Hexane	8.75
Methanol	7.75
Solvent Naphtha Heavy	9.50
Solvent Naphtha Light	8.50
Toluene	12.50
Xylene	15.00

DYES INTERMEDIATES (PRICES ARE WITHOUT TAX AND EXCISE)	
Alphanaphthylamine	60.00
Alpha Naphthol (Imp.)	170.00
Aceto Acetic Ester (Methyl)	63.00
Ammonium Molybdate	180.00
Anthraquinone	70.00
Anthranilic Acid	60.00
2-Amino-4-Nitrophenol (Imp.)	125.00
Blue B. Base (Local)	230.00
Beta Naphthol (Atul)	65.00
Benzidine Dihydrochloride (BDH)	78.00
Bromamine Acid	375.00
BON Acid	105.00
Chicago Acid	280.00
Coach Acid	56.00
C. Acid (Imp.)	260.00
Cyanuric Chloride (Japan)	120.00
2, 4, DNCB	26.00
Dihydrothio PTOS (Imp.)	600.00
Dimethyl Aniline	60.00
Diethyl Aniline	140.00
Di-amino stilbene disulphonic acid	120.00
3, 3-DCB (Imp.)	180.00
Gamma Acid (Atul)	170.00
H. Acid (Atul)	155.00
G. Salt	57.00
Isophthalic Acid	40.00
J. Acid	272.00
J. Acid Urea	275.00
K. Acid	95.00
MDPS (German)	200.00
MNA	76.00
Meta Urido Aniline	135.00
MPD (Local)	120.00
MPD (Japan)	165.00
Naphthenic Acid	12.00
N-Methyl J. Acid	395.00
N-Methyl Aniline	120.00
Naphthalene (Crude)	21.50
Naphthalene (Refined)	24.00
Ortho Anisidine (OA Imp)	85.00
Ortho Dichloro Benzene (ODCB)	10.50
OT Base	92.00
Para Dichloro Benzene (PDCB)	16.00
Para Anisidine (PA-Imp.)	110.00
Para Anisidine (PA-Local)	87.00
PNA	66.00
Para Cresidine (Imp.)	325.00
Para Amino Azo Benzene (India)	125.00
PNCB	28.00
Para Amino Acetanilide	145.00
1-Phenyl 3-methyl-5 Pyrazolone	120.00
Phenyl J. Acid	360.00
Para Amino Benzoic Acid	170.00
PT Base	88.00
Rhoduline Acid	490.00
Resist Salt	20.00
Resorcinol	140.00
Sodium Naphthlonate	63.00
5-Sulpho-Anthranilic Acid	60.00
Sulphanilic Acid	27.00
Sulpho Tobias Acid	100.00
Trichloro Benzene (TCB)	15.00
Tobias Acid	114.00

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When it comes to chemicals, we care a little extra. Making sure to produce chemicals that meet exacting standards of quality, purity and reliability. Backed by research and thorough testing. Our customer service can help you improve your present products and develop new ones. And remember, we can meet your requirement in bulk... whenever and wherever you want. why not try ?

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ISOAMYL BROMIDE
N-BUTYL BROMIDE
ETHYL BROMIDE
CETYL BROMIDE
LITHIUM BROMIDE
ISOPROPYL CHLORO ACETATE
METHYL CHLORO ACETATE
ETHYL CHLORO ACETATE
ISOPROPYL ACETATE
BENZOYL CHLORIDE
ACETYL CHLORIDE
CHLORO ACETYL CHLORIDE
CAPROIC ANHYDRIDE
ETHYL FORMATE
SODIUM BROMIDE
POTASSIUM BROMATE

Contact Manufacturers :

SONTARA ORGANO INDUSTRIES

OFFICE :
3-A Mangaldas Bldg. 2nd Floor,
R.N. 242, Mangaldas Road,
Bombay-400 002.
Phone : 315681 (O)
Resi. : 522207, 4123313

FACTORY :
SHED 16, M.I.D.C. CHEMICAL ZONE, AMBARNATH-421 501.
Phone : 2483 (F)

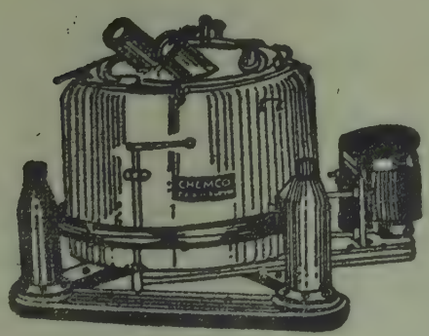
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Authorised Agent For Andhra Pradesh :
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Agent For South India (Except A.P.) — M/S. TECSYS
3, Krishnappa Maistry Street, Woods Road, Madras-600 002. Phone : 849727

Bombay Dyes Market

(Prices as on 29th March 1988)

ACID COLOUR	Per Kg
Acid Violet 4BS	143.00
Acid Maroon V	110.00
Acid Orange II	77.80
Acid Orange IIY	63.05
Acid Red A	107.25
Crosein Scarlet MOG	155.00
Acid Scarlet 3R	99.90
Acid Red 38N	135.00
Acid Red R2R	132.00
Acid Red RS	88.00
Acid Green V	230.00
Acid Patent Blue AS	250.00
Acid Coomasi Blue	200.00
Acid Yellow 5GN	65.00
Acid Red PG	85.00
Acid Red GRS	78.00
Acid Black 10 BX	121.95
Acid Black BX	98.40
Acid Black Wax	135.50
Procinil Yellow GS (ICI, UK)	265.00
Procinil Red GS (ICI, UK)	530.00
Procinil Blue RS (ICI, UK)	315.00
Procinil Scarlet G (ICI, UK)	600.00
Procinil Orange G (ICI, UK)	250.00
Procinil Rubine (ICI, UK)	550.00

DIRECT COLOURS	Per Kg.
Yellow 3GX	88.10
Gun Yellow RCH	124.00
Fast Yellow GCH	141.15
Yellow CFG Hly. Conc.	312.00
Fast Yellow GS	111.65
Fast Yellow CHRS	95.45
Viscose Orange	166.15
Fast Orange GR	133.75
Red	96.90
Dark Tan	78.25
Red IIR	72.55
Red 4B	169.10
Bordeaux BW	132.30
Fast Scarlet 4BS	166.55
Red 12B	170.55
Bordeaux Hly Conc.	194.00
Cotton Red N	117.05
Brill. Fast Helio B	278.00
Brill. Fast Helio 2B	297.00
Brill. Fast Helio 2RS	136.20
Brill. Fast Helio BS	116.10
Brill. Violet Extra	126.40
Blue 2B	86.40
Blue G	170.50
Sky Blue FB	188.25
Copper Blue GR	147.00
Fast Greenish Blue GL	114.60
Developed Black BT	116.10
Blue NB-2B	300.20
Blue NB-2BC	185.30
Developed Black NB-GHB	185.30
Green B	111.65
Green NB-B	188.25
Green 2B-N	188.25
Brown MR	154.40
Brown CN	107.25
Golden Brown G	140.35
Catechin G	120.50
Omega Tan	126.40
Catechin GS	102.80
Black E Hly Conc.	142.60
Black E Extra Hly Conc.	142.60
Black NB-ER Hly. Conc.	310.50

DISPERSOL COLOURS	Per Kg
Yellow 6G Powder	143.80
Red B 3B Powder	247.80
Red B 2B Powder	323.20
Red CB Powder	439.15
Red D2B Powder	477.40
Violet C 4R	521.90
Blue BG Powder	235.45
Blue BN Powder	103.75
Blue D 2R Powder	476.25
Navy BT Powder	243.90
Blue B 2G Powder	210.20
Black BT Powder	182.60
Blue BR Powder	390.20
Yellow 7GL	338.60
Yellow 5RX	218.80
Yellow 3G	367.25
Yellow	140.00
Yellow AL	135.30
Yellow Brown REL	247.50
Yellow FFL	463.60
Gold Yellow GG	259.70
Pink REL	247.00
Red REL	468.65
Red 2B	327.40
Red FB	324.20
Red Violet FBL	469.85
Orange 3R	196.65
Violet 3R	280.00
Violet RL	275.45
Violet 6R	485.75
Scarlet RR	214.85
Rubine 3B	223.05
Rubine CB	364.90
Blue GL	318.95
Blue BGF	636.55
Navy Blue RF	270.40
Brown 3REL	200.40
Black GEL	324.20
Dark Brown 3B	317.40

BASE COLOURS	Per Kg
Fast Yellow	80.20
Fast Orange GC	135.45
Fast Scarlet R	166.90
Fast Scarlet RC	126.65

Fast Scarlet RCR	99.05
Fast Scarlet G	121.65
Fast Scarlet GN	91.50
Fast Scarlet GG	72.70
Fast Scarlet GGS	72.75
Fast Red B	203.20
Fast Red RC	119.15
Fast Red R Flakes	149.25
Fast Red TR	166.80
Fast Red TR Oil	183.15
Fast Red RL	237.10
Fast Red KB Oil	201.90
Fast Bordeaux GP	201.95
Fast Garnet GBC	94.05
Fast Violet B	505.60
Fast Blue BB	521.45

NAPHTHOL COLOURS	Per Kg
ASG	217.00
AS	143.00
ASSW	279.75
ABBS	189.15
ASBO	195.65
ASD	175.50
ASOL	179.35
ASTR	279.75
ASPH	279.75
ASE	196.05
ASEI	184.40
ASLB	1632.60
ASBT	1817.00
ASWG	143.00
ASSG	397.70
ASSR	480.50

PROCION COLOURS	Per Kg
Golden Yellow HR	181.80
Brill. Yellow H4G	117.85
Supra Yellow H-8GP	168.55
Brill. Yellow HE6G	166.95
Yellow H-E4R	276.05
Brill. Yellow H7G	332.30
Yellow M4R	243.95
Yellow M GR	326.05
Brill. Yellow M4G	177.10
Brill. Yellow M8G	332.30
Yellow M 3R	217.60
Brill. Orange H 2R	241.85
Brill. Red H 7B	157.95
Brill. Orange M 2R	313.15
Brill. Red H 85	169.45
Brill. Scarlet H RN	245.05
Supra Red H-3BP	179.30
Brill. Red H-F3B	243.45
Brill. Magenta H3	167.00
Brill. Red M. 5B	98.90
Brill. Red M 8B	173.70
Brill. Pink MB	137.10
Brill. Magenta MB	121.55
Brill. Purple H-3R	180.20
Brill. Purple H-7R	175.40
Navy Blue H 3R	298.50
Brill. Blue H-GR	366.55
Brill. Blue H 5G	173.10
Blue H 5R	283.85
Brill. Blue H 7G	178.70
Brill. Blue H 7RX	358.15
Turquoise HA	234.45
Supra Blue H-3RP	335.70
Supra Turquoise H 2GF	181.50
Blue H 5RX	269.30
Navy Blue H ER	258.80
Blue H-ERD	305.80
Navy Blue M 3R	310.95
Brill. Blue MR	331.70
Brill. Blue M RX	214.20
Brill. Blue M-G	382.30
Blue M 4GD	344.60
Navy Blue M RB	318.75
Turquoise M-G	197.85
Brill. Blue M GX	302.50
Blue 3R Acre Powder	718.20
Dark Brown H 6R	248.45
Cobalt Oxide (per kg)	285.00
Green H 4BD	269.80
Green H-E4B	169.80
Red Brown H IF	143.25
Orange Brown H 28	209.05
Brown M GRN	188.60
Black H-N	283.35

SULFUR COLOURS	Per Kg
Navy Blue	99.85
Green G	105.55
Black Grains Extra	63.05
Black Grains OG	64.55
Black GXE Conc.	61.60
Black GXE	52.75
Black GXR	61.60
Black Grains 800	54.20
Black EXR Grains	64.55
Black EXR Grains 800	51.25

VAT COLOURS (ICI)	Per Kg
Yellow 5G Powder Fine	673.15
Yellow 5G Supra Disperse	439.30
Yellow 5G Acra Conc.	628.75
Yellow 3R Powder	588.85
Gold Orange 3G Pdr. Fine	952.15
Brill. Orange 6R Pdr. Fine	624.35
Gold Orange 3G Supra Disp.	601.30
Brill. Orange 6RX Powder	394.30
Brill. Red 3B Pdr. Fine	997.80
Brill. Red 3B Supra Disp.	713.20
Brill. Purple 4R Conc. Pdr.	470.75
Brill. Purple 3R Acra Powder	690.85
Brill. Purple 2R Hly Conc.	597.90
Brill. Purple 4R Supra Disp.	500.05
Brill. Purple 2R Acra Conc.	625.95
Blue R Powder Fine	542.15
Blue BC Conc. Pdr. Fine	522.50
Blue BC Acra Conc. Pdr. Fine	762.70
Blue R Conc. Pdr. Fine	577.65
Blue RR Supra Powder	629.35
Blue Conc. Powder	645.80
Brill. Blue 2R Hly. Conc.	378.55
Brill. Blue 2R Supra Disp.	115.65
Dark Blue 2R Powder Fine	389.25
Blue BC Supra Disp.	359.40
Jade Green XBN Powder Fine	438.20
Jade Green XBN Acra Conc. Powder	823.90
Jade Green 2G Pdr. Fine	419.65
Jade Green 2G Ptg. Paste	125.40
Jade Green XBN Ptg. Paste	126.00
Jade Green 2G Supra Disp.	496.00
Olive Green B Pdr. Fine	399.90
Olive D Pdr. Fine	444.30
Olive Green B Supra Disp.	308.25
Jade Green XBN Supra Disp. (N)	327.30
Olive OMW Pdr. Fine	698.55
Olive OMW Supra Disp.	538.05
Olive R. Pdr. Fine	422.95
Olive R. Pdr. Fine	422.95
Olive D Supra Disp.	361.70
Olive R supra Disp.	363.90
Olive D. Ptg. Paste	193.00
Olive Green B. Ptg. Paste	199.10
Olive Green B Acra Conc.	542.75
Olive R Acra Conc.	640.00
Olive Green B Acra Conc.	542.75
Brown R Pdr. Fine	835.00
Brown G. Pdr. Fine	795.00
Brown R Pdr. Fine	659.75
Dark Brown 3R Pdr. Fine	685.00
Brown G. Supra Disp.	449.90
Brown 2G Supra Disp.	554.00
Brown R Supra Disp.	422.95
Brown BR Powder	719.00
Dark Brown 3R Ptg. Paste	217.15
Dark Brown 3R Supra Disp.	414.55
Brown G Acra Conc.	733.95
Brown R Acra Conc.	766.00
Grey M. Powder Fine	768.80
Grey M. Supra Disp.	585.45
Blue BC Acra Conc. Pdr. Fine	762.70
Direct Black AC Supra Disp.	330.35
Direct Black AC Pdr. Fine	474.70
Direct Black CH Supra Disp.	393.20
Direct ACD Ptg. Paste	217.15

Madras Market

The import/Export policy for the period 1988 to 1991 announced by Government of India recently has not changed the situation in respect of chemicals very much. Soda Ash of TAC make was in short supply due to the plant taking a maintenance shut down but however, there was no spurt in the prices of soda ash, as other brands were fully available. Hydrogen peroxide continued to be in demand. Availability of all items was good.

(MADRAS MARKET RATES AS ON APRIL 2, 1988)

Acetic Acid — Glacial (per kg.)	16.00
Acid Slurry (Soft) (per kg)	26.00
Aluminium Sulphate Iron free (per tonne)	1800.00
Ammonium Bi-carbonate (per 25 kg.)	125.00
Ammonium Chloride SPIC (per tonne)	2000.00
Bleaching Powder — Mettur (per 25 Kgs. bags)	100.00
Borax Granular	650.00
Cresylic Acid 100% (per kg.)	85.00
Meta Cresol 40/42% (per kg.)	47.00
Para Cresol 80%/85% (per kg.)	55.00
Caustic Soda Flakes (Mettur) (per ton)	8200.00
Caustic Soda Flakes (Andhra sugar)	8200.00
Citric Acid — Indian (per kg.)	42.00
Copper Sulphate (per 50 kg.)	1000.00
Formic Acid (India) (per kg.)	27.00
Formaldehyde (per kg.)	7.00
Glycerine (per kg.)	40.00
Hydrosulphite of Soda TCPL (per kg.)	33.00
Hydrosulphite of Soda IDI (per kg.)	37.00
Hydrosulphite of Soda BASF (per kg.)	38.00
Hydrogen Peroxide (India) (per kg.)	35.00
Hyflo Supercel	20.00
Magnesium Carbonate Light	19.00
Potassium Bichromate (per kg.)	26.00
Phosphoric Acid (per kg.)	18.00
Phthalic Anhydride (per kg.)	28.00
Pentaerythritol (per kg)	52.00
Paraffin Wax (per kg.)	14.00
Oxalic Acid (per kg.)	20.00
Soda Ash (TAC) (per 75 kg.)	330.00
Soda Ash (TATA) (per 75 kg.)	325.00
Sodium Cyanide Indian (per kg.)	47.00
Sodium Cyanide Degussa (per kg.)	70.00
Sodium Bichromate (per kg.)	20.00
Sodium Bicarbonate (per 50 kg.)	280.00
Sodium Nitrite (per 50 kg.)	650.00
Sodium Nitrate (per 50 kg.)	425.00
Sodium Silicate (per tonne)	4000.00
Sodium Sulphate (per tonne)	3500.00
Sodium Sulphide Flakes (per tonne)	13,000.00
Sodium Bi-sulphite (per 50 kg.)	185.00
Stearic Acid (per kg.)	30.00
Trisodium phosphate (per 50 kg.)	350.00
Titanium Di-oxide Indian TTP (per kg.)	48.00
Titanium Di-oxide Indian Rutile (per kg)	58.00
Urea Tech (per tonne)	2800.00
Zinc Oxide (per kg.)	34.00
Zinc Chloride Powder (per kg.)	12.00
Zinc Sulphate (per tonne)	4500.00
Di-octyl phthalate (per kg.)	47.00
Di-butyl phthalate (per kg.)	47.00

SOLVENTS

Acetone (H.O.C.) (per kg.)	19.00
Isopropyl Alcohol NOCIL (per kg.)	21.50
Diacetone Alcohol NOCIL (per kg.)	28.50
Benzene SAIL (per kg.)	14.00
Diethylene Glycol NOCIL (per kg.)	36.00
Butanol NOCIL (per kg.)	33.00
Butanol NOCIL (per kg.)	33.50
Toluene SAIL (per litre)	14.00
Xylene IPCL (per litre)	15.00
Phenol HOC (per kg.)	28.00
Turpentine (per litre)	16.50
Sorbitol (per kg.)	30.00
Trichloroethylene MCIC (per kg.)	23.50
Carbon Tetra Chloride (per kg.)	13.00
Chlorofrom (per kg.)	24.00
Methylene chloride (per kg.)	21.00
Methyl Ethyl Ketone (per kg.)	42.00
Cellosolve (per kg.)	50.00
Triethanolamine (per kg.)	23.00
Ethyl Acetate (per kg.)	22.00
Butyl Acetate (per kg.)	40.00

Delhi Market

DELHI: APRIL 1 (NNS) — A steep fall of Rs. 100/175 in sodium nitrite provided the main feature of trading in the local chemicals market during last week, says NNS. Hexamine also dropped by Rs. 4, while soda ash Tata, soda bicarb NAL caustic soda flake advanced by Rs. 5/15 on tight supply. Turnover was moderate.

Sodium nitrite nose-dived sharply by Rs. 100/175 at Rs. 800/825 per 50 kg. due to satisfactory supply as well as negligible offtake. Hexamine suffered a fall of Rs. 4 at Rs. 44 per kg. in the absence of demand by consumers at higher level. Titanium dioxide Anatase and RC.822 edged up by 50 paise/Re. 1 thanks to fresh buying support.

Menthol flake and medium declined by Rs. 3/9 at Rs. 168 and Rs. 185 per kg. respectively owing to dehoarding tendency by stockists due to tight money conditions as well as arrivals of new crop. Menthol bold declined by Rs. 5 at Rs. 193 on persistent offerings but at the week-end owing to cut in supply and good demand by consumers it rallied again and closed at Rs. 198. Mentha oil eased by Rs. 10 at Rs. 135 and DMO ruled easy at Rs. 65 per kg.

Tartaric and citric acid slipped by Rs. 25/50 at Rs. 7100 and Rs. 2250/2550 per 50 kg. in the absence of demand. Ammonia bicarb moved down by Rs. 4 at Rs. 118 per 25 kg. due to improved supply and fall in demand by bakeries. Zinc oxide suffered a steep fall of Rs. 2000 at Rs. 32000/38000 per tonne for want of support. Soda ash Tata, soda bicarb NAL as well as caustic soda flake went up by Rs. 5/15 on poor supply and good demand. Carbon Tetrachloride firmed up by Re. 1 at Rs. 17.50 on reduced arrivals. Delhi chemicals market remained closed on 31st March and 1st April in respect of Mahavir Jayanti and Good Friday.

Dyes and colours ruled quiet at their previous levels.

(DELHI MARKET RATES AS ON APRIL 1, 1988)

Ammonia Bicarb (per 25 kg)	118.00
Mercury (per flask)	9000.00
Soda ash (per bag)	255-295.00
Ammonium chloride (per 50 kg.)	105-160.00
Caustic soda solid (per 50 kg)	**410.00**
Caustic soda flakes (per 50 kg)	410-415.00
Citric acid (per 50 kg)	2250-2550.00
Stable Bleaching Powder Shriram (per 25 kg)	95.00
Stable Bleaching Powder KCI (per 25 kg)	85.00
Stable Bleaching Powder MODI (per 25 kg)	93.00
Sod. Bicarbonate (per 50 kg)	255-285.00
Sod. Hydro Sulphite (per kg)	**34-36.00**
Rangolite (per kg)	50-80.00
Boric acid Technical (per 50 kg)	975-985.00
Paraffin wax (per 50 kg)	575.00
Taratric acid (per 50 kg)	7,100.00
Borax Granular (per 50 kg)	570.00
Borax Crystal (per 50 kg)	580.00
Sodium Nitrate (per 50 kg)	430-450.00
Sodium Nitrite (per 50 kg)	800-825.00
Camphor Powder (per kg.)	**93.00**
Camphor Thal (per kg)	99.00
Menthol Medium (per kg)	185.00
Menthol Flake (per kg)	168.00
Menthol Bold (per kg)	198.00
Glycerine (per kg)	43-45
Sodium Silicate (per quintal)	200-250.00
Hexamine (per kg)	44.00
Acetic Acid Glacial (per kg)	14.50-18.00
Copper Sulphate (per quintal)	1800-2100.00
Formic acid (per kg)	30.00
Formaldehyde (per kg)	6.50
Hydrogen Peroxide (per kg)	31-32.00
Calcium Carbonate (per tonne)	3500-4000.00
Acid Slurry Soft (per kg)	23.00
Acid Slurry Hard (per kg)	30.00
Phosphoric Acid (per 50 kg)	825.00
Pot. Nitrate (per quintal)	900-1200.00
Pot. Permanganate (per 50 kg)	2300.00
Sod. Bichromate (per 50 kg)	1025-1125.00
Tri-Sod. Phosphate (per 50 kg)	340-350.00
Titanium Dioxide Anatase (per kg)	51.50
Titanium RC-822 (per kg)	67.00
Zinc Oxide (per mt)	32000-38000.00
Phenol Carbolic Acid (per kg)	42.00
Carbon Tetrachloride (per kg)	17.50
Chloroform (per kg)	26.00
Sodium Sulphate (per 50 kg)	155-158.00
Naphthalene Balls (per 50 kg)	1400.00

DYES & COLOUR	per kg
Naphthol AS	150.00
Naphthol AS0	235.00
Naphthol AS01	200.00
Naphthol ASTR	302.00
Naphthol AS01	191.00
Naphthol AS80	208.00

DIRECT DYES	(per kg)
Black E. Conc.	92-155.00
Diazo Black B.T.	125.00
Green B.	119.00
Blue 2-B	86.00
Sky Blue FB	200.19
Basic Auramine 'O' Conc.	55-110.00
Basic Rohdamine B.600%	220-320.00
Basic Methylene Blue	92-130.00
Basic Violet	142-160.00
Basic Malachite Green	160-185.00
Acid Orange	45-52.00

Materials Imported

BOMBAY
(From 23.12.1987 to 28.12.1987)

ACID GRADE FLUORSPAR : From China : Navin Fluorine Industries, 81.409 Mts., Rs. 1,14,784.

ADIPIC ACID: From Turkey: R. T. Exports Private Ltd., 6,000 Kgs., Rs. 1,20,522.

AJINOMOTO CO-L-LYSINE MONO HCL: From U.S.S.R.: Oil and Natural Gas Commission, 2,000 kgs., Rs. 76,768.

ALDEHYDE C-10 DECYL : From Czechoslovakia : Fibro Plast Corporation, 48.750 kgs., Rs. 8,424.

ALDEHYDE C.-12 LAURIC : From Czechoslovakia : Fibro Plast Corporation, 65.625 kgs., Rs. 28,617.

ALDEHYDE C-9 NONYL : From Czechoslovakia : Fibro Plast Corporation, 2.625 kgs., Rs. 1,264.

ALDRIN TECHNICAL: From F.R.G. : Crystal Polymers and Additives Ltd., 5,250 kgs., Rs. 5,20,789.

ALLYL AMYL GLYCOLATE : From Czechoslovakia : Fibro Plast Corporation, 15,000 kgs., Rs. 8,595.

ALLYL CYCLOHEXYL PROPIONATE : From Czechoslovakia : Fibro Plast Corporation, 150 kgs., Rs. 60,672.

ALPHA HEXYL CINNAMIC ALDEHYDE : From Czechoslovakia : Fibro Plast Corporation, 225 kgs., Rs. 22,688.

AMINO BENZOIC ACID SULPHAMIDE : From Korea : Department of Atomic Energy, 2.427 Mts., Rs. 11,47,085.00.

ASUNTOL 50% WETTABLE POWDER : From Germany : G. Loucatos and Co., 100 Kgs., Rs. 26,388/-.

BASIC CHROMIUM SULPHATE : From Kenya : Construction and Industries Ltd., 18,000 Kgs., Rs. 1,91,835.00.

C. ACID : From U.S.A. : United States Information, 5,000 Kgs., Rs. 2,58,164.00.

CALCIUM BROMIDE : From Korea : Fusebase Eltro P. Ltd., 300 Kgs., Rs. 88,619.00.

CAPROLACTAM : From Netherlands : Jagatjit Cotton Textile Mills Ltd., 51,000 Kgs., Rs. 12,76,123; 51,000 Kgs; Rs. 12,76,123.

CARBON BLACK : From Germany : Marigold Paints, 300 Kgs., Rs. 49,391.00; From Korea : Uptron Colour Picture Tubes Ltd., 300 Kgs., Rs. 49,391.

CELLOSOLVE ACETATE 99% : From U.S.A. : Asian Paints I. Ltd., 15.34 Mts., Rs. 1,89,900.

CETO STEARYL ALCOHOL: From Germany : Fulford (I) Ltd., 2,000 Kgs., Rs. 42,797.

CHOLESTEROL USP/IP/BP: From Jordan : Rama Krishi Rasayan Ltd., 200 Kgs., Rs. 94,527.

CITRONELLYL PROPIONATE : From Czchoslovakia: Fibro Plast Corporation, 56.250 Kgs ; Rs. 11,496.

CYCLOHEXANONE : From Hong Kong : Crystaline Corporation, 13.68 Mts., Rs. 1,90,168.

DICALCIUM PHOSPHATE : From Taiwan : A. Arti Leathers P. Ltd., 54,000 Kgs., Rs. 7,26,580.

2.4 DICHLORO TOLUENE PURE : From Netherland : Henkel Chemicals Ltd., 5,000 kgs., Rs. 4,80,512.

DICYANDIAMIDE : From Germany : Explogel India, 16,000 kgs., Rs. 3,71,806 ; From Taiwan : Globe Agencies, 32.000 Mts., Rs. 7,58,737.

DIETHYLENE GLYCOL : From Iran : Gulati Enterprises, 9.45 Mts., Rs. 63,806 ; From Taiwan : Gadani Industries, 9.45 Mts., Rs. 63,806 ; From Iran : Bhagwandas and Sons, 9.45 Mts., Rs. 63,806; From Yugoslavia : Beekay Sales P. Ltd., 18,800 kgs., Rs. 1,25,692.

DIHYDROMYRCENOL: From Czechoslavakia : Fibro Plast Corporation, 225 kgs., Rs. 43,618.

DIMER ACID : From Japan : J.K. Synthetics Ltd., 10,260 kgs., Rs. 1,56,057.

DIMETHYL ACETAMIDE : From Iran : M.S. International, 1,48,200 kgs., Rs. 23,93,693.

1 - DIMETHYLAMINO - 2 - CHLOROPROPANE : From F.R.A. : Mishra Dhatu Nigam Ltd., 2,420 kgs., Rs. 3,07,132.

3.7 - DIMETHYL - 2.6 -OCTADIEN - 1 - YL - PROPIONATE : From Czechoslovakia : Fibro Plast Corpn., 56.250 kgs., Rs. 16,433.

DIOCTYL PHTHALATE : From Thailand : Abdullabhai Abdul Kader, 8.000 Mts., Rs. 87,378 ; From Netherland : Peico Electronics and Electricals, 8.000 Mts., Rs. 87,378 ; From Germany : Douglas Corporation, 8.000 Mts., Rs. 87,378 ; 8.000 Mts., Rs. 87,378.

DIOCTYL TIN OXIDE: From Korea : Cawasji Behramji & Co., 2,000 kgs., Rs. 2,66,972.

4-4 DIPHENYL METHANE DI ISOCYANATE : From Japan : Bharat Heavy Electricals Ltd., 5,000 kgs., Rs. 1,15,843.

DIPHENYL OXIDE TECHNICAL : From France : Flour and Food Ltd., 31,026 kgs., Rs. 6,90,079.

D. PANTOTHENYL ALCOHOL USAP-NF : From Switzerland : E. Merck India Ltd., 300 kgs., Rs. 71,491.

D-PARA HYDROXYPHENYL GLYCINE DANE SALT (METHYL POTASSIUM): From Japan : Mirc Electronics P. Ltd., 1,000 kgs., Rs. 2,48,896.

EPICHLORO HYDRINE : From Japan : Saka Electronics P. Ltd., 1,200 kgs., Rs. 27,008.

2-ETHY ETHOXY PROPYLAMINE : From Korea : Asian Plastics, 85 kgs., Rs. 73,468.

ETHYLENE DICHLORIDE : From China : Western Chemicals, 7410 kgs., Rs. 1,60, 494.

ETHYLENE GLYCOL MONOMETHYL ETHER : From Australia : Punjab Woolcombers Ltd., 4,940 kgs., Rs. 63,818.

2-ETHYL HEXANOL : From U.K. : Zenith Tin Works P. Ltd., 23.975 kgs., Rs. 3,58,828; From Canada : Indian Xerographic Systems Ltd., 26,600 kgs., Rs. 3,77,163.

ETHYL METHYL PHENYL GLYCIDATE : From Czechoslovakia : Fibro Plast Corporation, 5.625 kgs., Rs. 1,643.

FERRIC AMMONIUM EDTA : From U.K. : Afga Gevert India Ltd., 3,000 kgs., Rs. 87,751.

FERRO MANGANESE POWDER : From Korea : Gimpex Rubbers, 25,000 kgs., Rs. 3,97,805.

FLORALOZONE : From Czechoslovakia: Fibro Plast Corporation, 11.25 kgs., Rs. 13,160.

FORMALIN SOLUTION : From U.A.E. : Roffe Speciality Chemicals, 175 kgs., Rs. 637.

FUNGICIDES : From Sweden : Bharat Heavy Electricals Ltd., 7,095 kgs., Rs. 5,70,403.

GAMMA DECALACTONE : From Czechoslovakia : Prabhat Glass Beads Co., 10 kgs., Rs. 11,916; Fibro Plast Corporation, 11,250 kgs., Rs. 13,160.

GAMMA FERRIC OXIDE : From Japan : Bajaj Auto Ltd., 875 kgs., Rs. 86,157; From UK : The National Newsprint and Paper, 10,000 kgs., Rs. 4,56,880.

GUM ROSIN : From Indonesia : Dujowala Resins and Terpenes, 36 Mts., Rs. 2,24,688; Thermal Coatings P. Ltd., 18 Mts., Rs. 1,12,781.

GUM ROSIN WG. GRADE : From Japan : Mitsui & Co. Ltd., 23,850 Mts. Rs. 1,48,404.

HEXA CHLORO CYCLOPENTADIENE : From U.K.K. : Rubbonsha International Rectif. 40,000 kgs., Rs. 9,21,445.

1, 4 - HEXANEDIOL : From U.K. : Jindal Dye Intermediates P. Ltd., 2,090 kgs., Rs. 1,25,122.

HEXYLSALICYLATE : From Czechoslovakia: Fibro Plast Corporation, 750 kgs., Rs. 62,988.

HYDROSULPHITE CONCENTRATE : From Japan : Kirloskar Cummins Ltd., 10,000 kgs., Rs. 1,12,533.

IMIDAZOLE : From U.K. : Himson Textile Engineering Industries P. Ltd., 800 kgs., Rs. 1,00,618.

INSOLUBLE SULPHUR : From Germany : Polymer Products, 1,000 kgs., Rs. 29,933.

ISOCYANATE : From U.S.A.: Ishwar Arts, 15.87 Mts., Rs. 4,93,934; From Germany : Mehta Industrial Corporation, 18,000 kgs., Rs. 4,63,326; From Brazil : Prestige, HM Poly containers Ltd., 54 MT Rs. 6,71,939.

ISO OCTYL THIO GLYCOLATE: From Netherland: Ventri Chemicals P. Ltd., 2,730 kgs., Rs.1,19,326.

ISO PHTHALIC ACID SB : From Japan : Hi Tech Industries, 9.50 Mts., Rs. 1,19,872.

KITAZIN TECHNICAL MINIMUM 94% : From Germany : Bajaj Tempo Ltd., 15,000 Kgs., Rs. 8,93,643.

LIGNIN SULPHONATE : From U.A.E. : Roffe Speciality Chemicals, 999 Kgs., Rs. 3,636; 5,000 Kgs., Rs. 13,867.

LILIAL : From U.K.K. : Bharat Heavy Electricals Ltd., 1,000 Kgs., Rs. 2,51,037.

L. LYSINE MONOHYDROCHLORIDE FEED GRADE MINIMUM 98.5% : From Thailand : S.K. Oil Trading Co., 2,000 Kgs., Rs. 75,198.

MAGNESIUM ALUMINIUM SILICATE : From Belgium : Peico Electronics and Electrical, 25 Kgs., Rs. 286.

META TOLUENE DIAMINE 80/20: From Netherland: Shree Syntheitcs Ltd., 2,600 kgs., Rs. 79,876.

METHACRYLAMIDE : From Korea : Phoenix Overseas P. Ltd., 600 kgs., Rs. 39,718.

2-METHOXY 2, 3 DIHYDRO 4 H PYRAN : From Netherland: Associated Rubber Industries, 6,000 kgs., Rs. 2,80,390.

METHOXY PROPYLAMINE: From Japan : Balumal Sons, 510 kgs., Rs. 30,934.

3 METHYL AMINO PROPYL AMINE : From Germany : Embassy of Brazil : 2,040 kgs., Rs. 1,85,004.

METHYL DIHYDRO JASMONATE : From Czechoslovakia : Prabhat Glass Beads Co., 200 kgs., Rs. 75,794.

METHYL ETHYL KETONE: From Germany : The Motwane Manufacturing Company Private Ltd., 5,115 kgs., Rs. 49,434; From Belgium : Sima Traders, 5,115 kgs., Rs. 49,434; From Netherland : Raptakos Brett and Co. Ltd., 5,640 kgs., Rs. 99,414; From Japan : Motonori Katsuki, 5,115 kgs., Rs. 49,434; The Supreme Industries Ltd., 5,115 kgs., Rs. 49,434; From Malaysia: R.K. Industries, 5,115 kgs., Rs. 49,434.

METHYL THIOPHENE: From Japan : Century Textile and Industries, 600 kgs., Rs. 2,24,694.

MURIATE OF POTASH: From Turkey : Chetan Kumar & Co., 19,400 Mts., Rs. 2,53,33,315.

MYRISTYL BROMIDE: From Japan : Shah Enterprises, 2,850 kgs., Rs. 1,79,225.

N. CYANOETHYL N ACETOXYETHYL ANILINE : From Germany : Premier Traders & Agencies, 2,116 kgs., Rs. 1,24,665.

NEOMYCINE SULPHATE USP : From U.S.A. : Gas Authority of India Ltd., 100 kgs., Rs. 87,378.

NICKEL CATALYST : From U.S.A. : Shree Digvijay Cement Co. Ltd., 960 kgs., Rs. 66,726.

N-METHYL ANILINE : From Germany : Central Scientific Instruments, 950 kgs., Rs. 57,478; From U.S.A. : Mafatlal Industries Ltd., 950 kgs., Rs. 57,478; The Mafatlal Fine Spinning and Manufacturing Co. Ltd., 950 kgs., Rs. 57,478; From Japan : Jay Chemical Industries, 950 kgs., Rs. 57,478.

OCTOIC ACID : From Japan: Shambulal L Rotliwala, 7,030 kgs., Rs. 1,01,262.

OXALIC ACID : From Japan: Peico Electronics and Electricals, 200 kgs., Rs. 1,648; 1,500 kgs., Rs. 12,360.

PARA FORMALDEHYDE : Nahar Spinning Mills Ltd., 18,000 kgs., Rs. 1,00,088.

PARA OCTYL PHENOL : From Japan : J. N. Marshall and Co. 5 Mts., Rs. 1,05,913.

PERCHLORO ETHYLENE : From Iran : Lalchand Ramchand, 10,230 kgs., Rs. 71,781; From Germany : Elecon Engineering Co. Ltd., 10,230 kgs., Rs. 71,781.

PHENOL : From Netherland: Asian Paints India Ltd., 93.600 Mts., Rs. 11,89,618.

PHENYL ACETALDEHYDE DIMETHYL ACETATE : From U.K.K. : Bharat Heavy Electricals Ltd., Rs. 500 kgs., Rs. 1,34,142.

PHENYL PROPANOLAMINE HYDROCHLORIDE B.P : From Switzerland : Bharat Electronics Ltd., 150 kgs., Rs. 58,263.

PHTHALIC ANHYDRIDE : From Thailand : Nandini Trading Co., 54,000 kgs., Rs. 4,78,993.

PLASTICIZER : From U.K. : Dyes Distributors India Ltd., 15.876 Mts Rs. 2,12,917; 15.876 Mt Rs. 2,12,917.

POTASSIUM CARBONATE : 99/100% GRANULAR : From U.K. : Thakurdas Sons, 18,000 kgs., Rs. 1,16,769.

PYRIDINE PURE : From Sweden : Vazir Glass Works Ltd., 1,170 kgs., Rs. 61,959.

ROCK PHOSPHATE : From Turkey: Chetan Kumar & Co., 4,000 Mts., Rs. 27,85,535. ; 2,000 Mts., Rs. 13,74,935; From Spain: Larsen and Toubro Ltd., 2,500 kgs., Rs. 17,40,959.; From Germany : Bagger Forst Tools Ltd., 3,250 kgs., Rs. 22,63,247.

RUBBER CHEMICALS: From U.K.K. : Oriental Aromatics, 500 kgs., Rs. 31,440; From Belgium : Gujarat State Fertilizer Co. Ltd., 300 kgs., Rs. 31,903.

SELENIUM METAL PELLETS : From U.S.A. : The Director of Lighthouse, 540 kgs., Rs. 2,19,479.

SILICON METAL : From Pakistan : Sai Samanaran & Co., 10 Mts., Rs. 1,74,756.

SODIUM ALGINATE : From Korea : Nahar Spinning Mills Ltd., 6,625 kgs., Rs. 2,10,503.

SODIUM HYPOPHOSPHITE: From Belgium : Kotecha Investment Corporation Ltd., 2,500 kgs., Rs. 1,03,596.

SODIUM MONOFLUOROPHOSPHATE : From U.K.K. : Chipco Bonding Systems (India) P. Ltd., 850 kgs., Rs. 38,487.

SOLVENT CYCLOHEXANONE : From Germany : Monopol Chemicals Ltd., 5,070 kgs., Rs. 74,526.

STEARIC ACID : From Korea : Mullard Tubes Ltd., 45,000 kgs., Rs. 3,43,547.

STYRENE MONOMER: From China : Western Chemicals, 7,410 kgs., Rs. 1,60,494 ; 290 kgs., Rs. 8,344 ; From U.S.A. : Tata Exports Ltd., 6,600 kgs., Rs. 1,26,262 ; 4,400 kgs., Rs. 84,175 ; From G.D.R. : Ankur Textiles, 6,600 kgs., Rs. 1,26,262; From France : Meltron Semi Conductors Ltd., 6,600 kgs., Rs. 1,26,262 ; From Taiwan : Trojan Sports Wear P. Ltd., 6,600 kgs., Rs. 1,26,262 ; From Japan : Bombay Pharma Products, 6,600 kgs., Rs. 1,26,262 ; Ganpati Overseas Trading Co., 4,400 kgs., Rs. 84,175.

TANNING AGENTS SYNTHETIC : From Czechoslovakia: Bharat Pumps and Compressors Ltd., 11,000 kgs., Rs. 2,07,959.

TETRAHYDROFURAN: From Germany : National Fertilisers Ltd., 4,732 kgs., Rs. 1,56,619.

TETRA HYDROMUGUOL : From Czechoslovakia : Fibro Plast Corporation, 168.750 kgs., Rs. 37,453.

TETRAMETHYL AMMONIUM HYDROXIDE : From Japan : Chandra Industries, 500 kgs., Rs. 69,242.

TETRA N BUTYL TIN CRUDE : From U.S.A. : Nirmal Chemical Works P. Ltd., 2,800 kgs., Rs. 2,97,759.

THEOPHYLINE ANHYDROOUS : From Sweden : Luthra Engineering and Radiator Co., 3,000 kgs., Rs. 6,12,062.

THORIUM NITRATE : From Iran : Deepak Dharamshi, 15,000 kgs., Rs. 12,01,454.

TITANIUM DIOXIDE: From U.S.A. : Kirloskar Cummins Ltd., 2,500 kgs., Rs. 47,515 ; From U.K.K. : Nawal Tin Factory : 100 Mts. Rs. 26,14,734 ;

From U.S.A. : Voltas Ltd., 6.000 Mts., Rs. 1,81,627.

4-TOLUIDINE 3-SULFONIC ACID : From Germany : Automobile Corporation of India, 4,050 kgs., Rs. 1,86,038.

TARTARIC ACID BP. POWDER : From U.S.A. : Tata Exports Ltd., 1,000 kgs., Rs. 43,096.

TRIBUTYL AMINE : From Germany : Suedex, 290 kgs., Rs. 10,303.

TRICHLOROTRIFLUOROETHANE : From Japan : Mafatlal Industries Ltd., 1,500 kgs., Rs. 28,000 ; From Japan : Mafatlal Industries Ltd., 1,000 kgs., Rs. 23,036 ; From Japan : Mafatlal Industries Ltd., 3,750 kgs., Rs. 76,456.

3-4-5 TRIMETHOXY BENZALDEHYDE : From Netherland : Shree Synthetics Ltd., 1,020 kgs., Rs. 3,14,641.

3-4-5 TRIMETHOXY BENZALDEHYDE MINIMUM 99% : From Spain : Modi Arc Electrodes Co., 2,000 kgs., Rs. 5,62,664 ; From Germany : Swastic Industries, 2,000 kgs., Rs. 5,03,088.

TRIPLAL : From Czechoslovakia : Fibro Plast Corporation, 26,250 kgs., Rs. 6,747.

WAX EMULSION : From U.A.E. : Roffe Speciality Chemicals P. Ltd., 670 kgs., Rs. 3,640.

XYLENOL PURITY MINIMUM 99% : From Canada : Satia Paper Mills Ltd., 2,000 kgs., Rs. 1,65,422.

DYES MATERIALS IMPORTED

BOMBAY

(From 23.12.87 to 28.12.87)

HOSTAPERM VIOLET: From U.S.A. : Narmada Cement Co. Ltd., 50 kgs., Rs. 43,325.

LOW DENSITY POLY ETHYLENE : From Japan : Jagdish Textile Dyeing and Printing, 24.000 Mts., Rs. 7,81,928.

NAVY BLUE : From Japan : Kirloskar Brothers Ltd., 26,250 kgs., Rs. 2,06,778.

NEOZAPON BLUE : SOLUTION BLUE : From U.S.A. : United States Embassy, 250 kgs., Rs. 10,229.

NEPTUNE BLUE BASE 634 : From Canada : Hind Filters P. Ltd., 50 kgs., Rs. 24,735.

SULPHUR YELLOW BROWN : From Japan : Mahindra Sintered Products, 2,500 kgs., Rs. 59,576.

Plastic Materials Imported

BOMBAY

(From 23.12.87 to 28.12.87)

HIGH DENSITY POLY ETHYLENE : From Czechoslovakia : Naresh Traders, 12.500 Mts., Rs. 1,02,009 ; 12.500 Mts., Rs. 1,02,009 ; 12.500 Mts., Rs. 1,02,009 ; 12.500 Mts., Rs. 1,02,009 ; From U.K.K. : Gabriel India Ltd., 13,750 kgs., Rs. 16,623.

HIGH DENSITY-POLY ETHYLENE : From Brazil : Prestige HM Poly Containers Ltd., 54.000 Mts., Rs. 6,71,939.

LOW DENSITY ETHYLENE: From U.S.A. : National Dairy Development Board, 10.000 Mts., Rs., 1,19,152 ; From China: S.S. International, 10.000 Mts., Rs. 1,19,152 ; From Brazil : K. Raheja Mercantile Corporation, 10.000 Mts., Rs. 1,19,152; 10.000 Mts., Rs. 1,19,152.

POLYSTYRENE MOULDING POWDER : From U.S.A. : Associated Rubber Industries, 17.000 Mts., Rs. 3,15,092.

POLYTETRAFLUOROETHYLENE RESIN : From Japan : Poonam Plastic Industries, 8,950 kgs., Rs. 12,79,997.

POLYURETHANE RESIN : From U.K.K. : Zincox Chemicals, 600 Lbs., Rs. 20,564.

POLYVINYL ALCOHOL : From Germany : Gujarat Nylons Ltd., 5,000 kgs., Rs. 1,12,533.

PVC RESIN : From Brazil : The Indian Aluminium Cable Ltd., 15 Mts., Rs. 1,78,318 ; Bengal Polymers P. Ltd., 15 Mts., Rs. 1,78,318 ; Vicky Electronics, 15 Mts., Rs. 1,78,318 ; Chem Plast, 15 Mts., Rs. 1,78,318 ; Cable and Wire Industries, 15 Mts., Rs. 1,78,318.

PVC RESIN SUSPENSION GRADE : From Australia : Zenith Ltd., 15 Mts., Rs. 1,78,318 ; From Brazil : Victor Cable Corporation, 15 Mts., Rs. 1,78,318 ; Bengal Polymers P. Ltd., 15 Mts., Rs. 1,78,318 ; Star Plastics, 15 Mts., Rs. 1,78,318 ; Victor Cable Corporation 15 Mts., Rs. 1,78,318 ; Shiv Cable and Wire Industries, 15 Mts., Rs. 1,78,318.

SYNTHETIC RESIN : From Austria : Wellaman (H) P. Ltd., 4,375 kgs., Rs. 1,15,842.

VINYL POLYMER : From Iran : Dolatramtikamdas, 1,520 kgs., Rs. 65,802.

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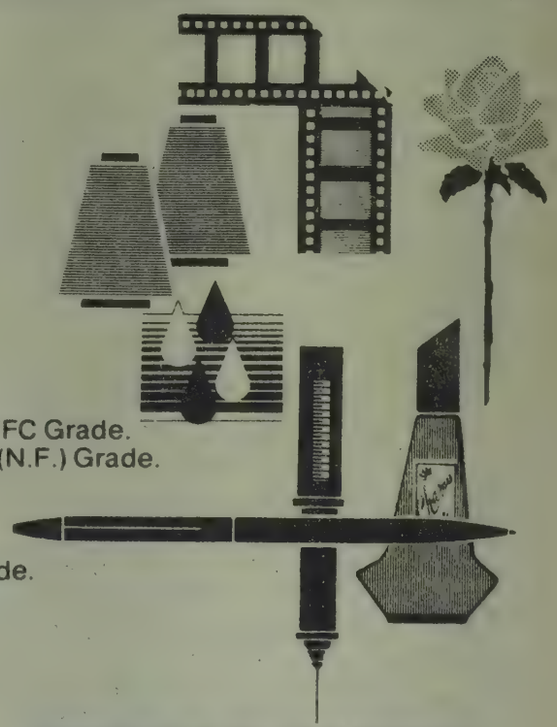
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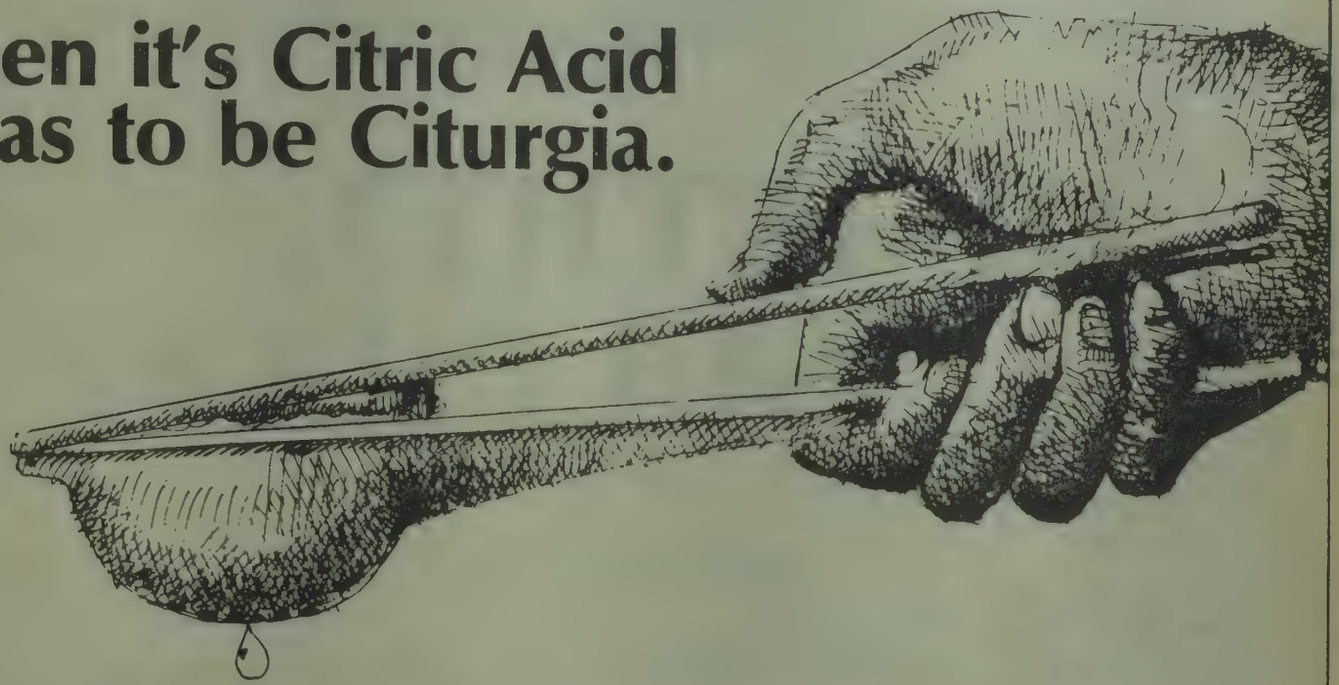
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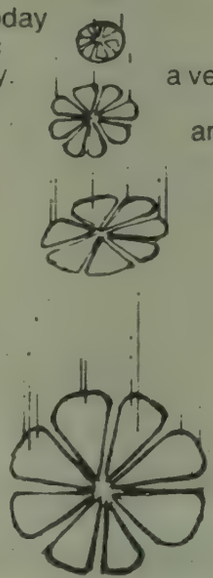
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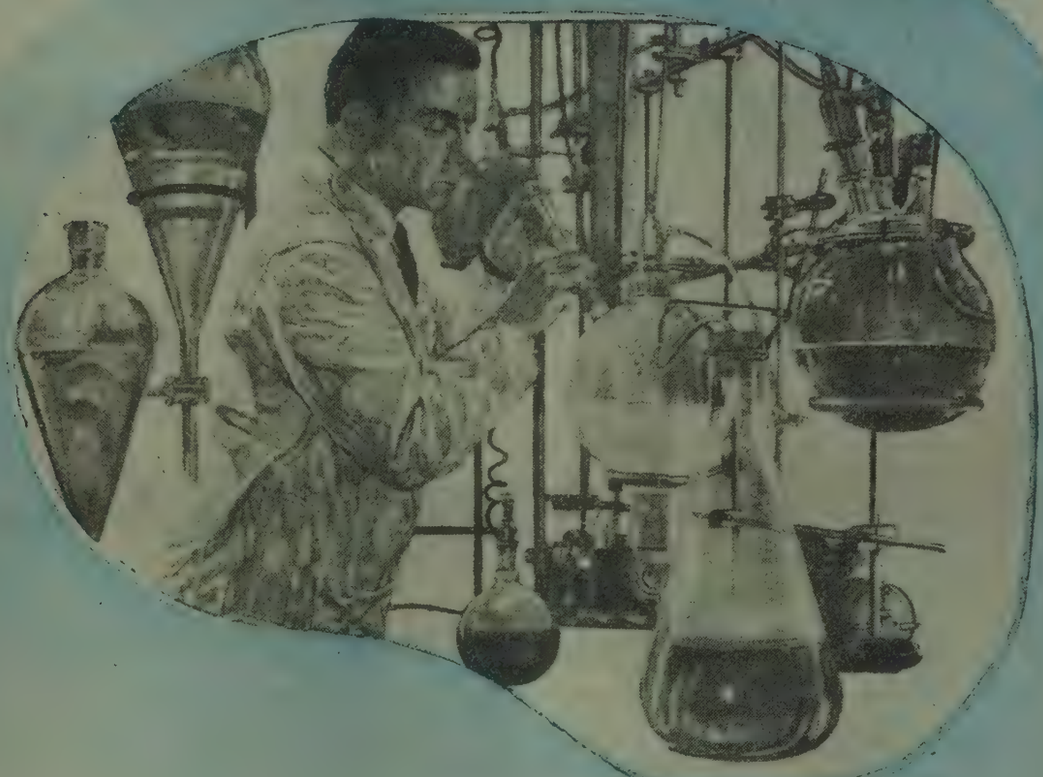
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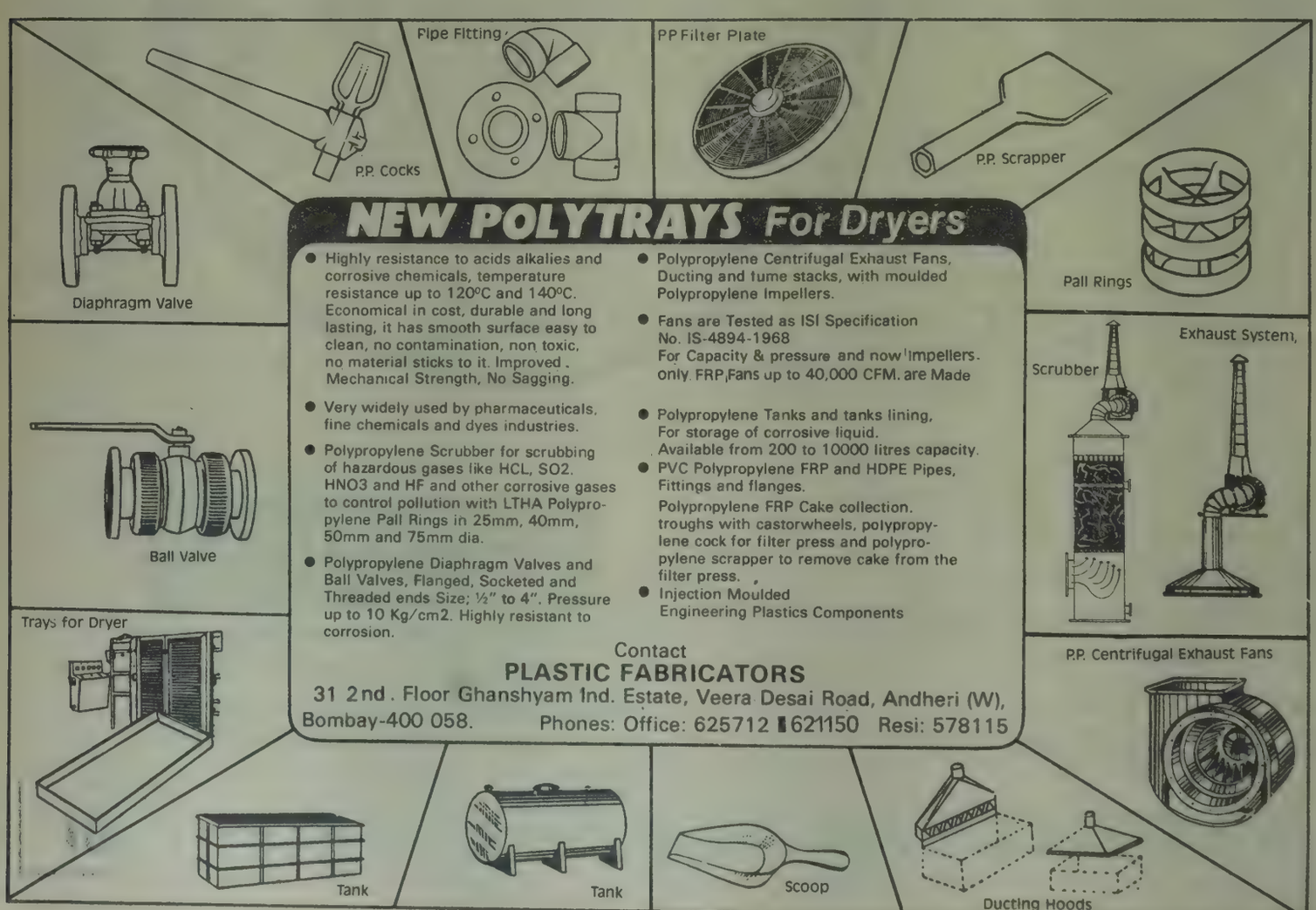
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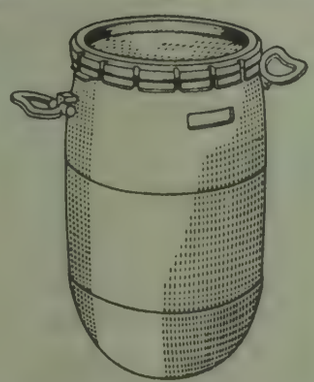
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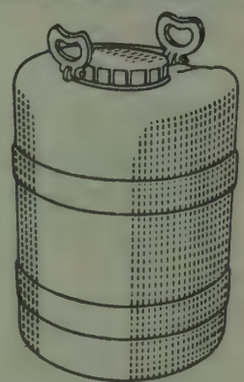
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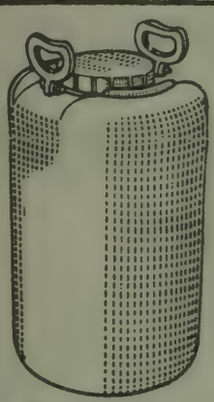
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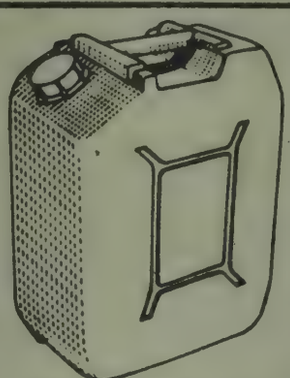

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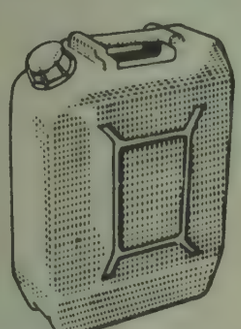

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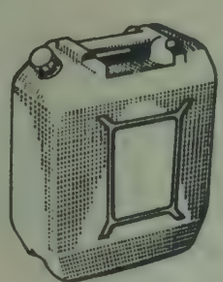

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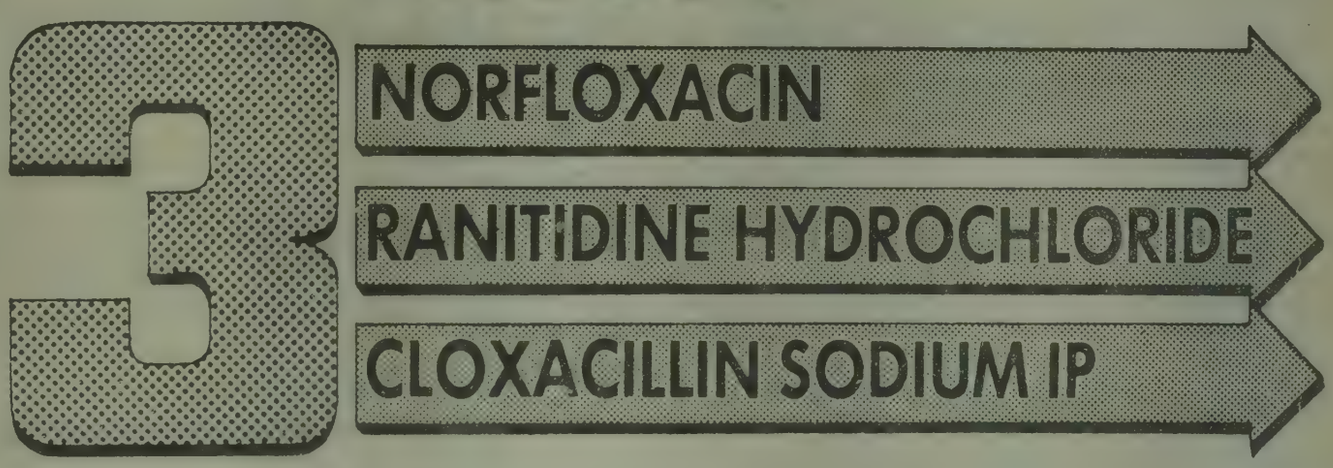
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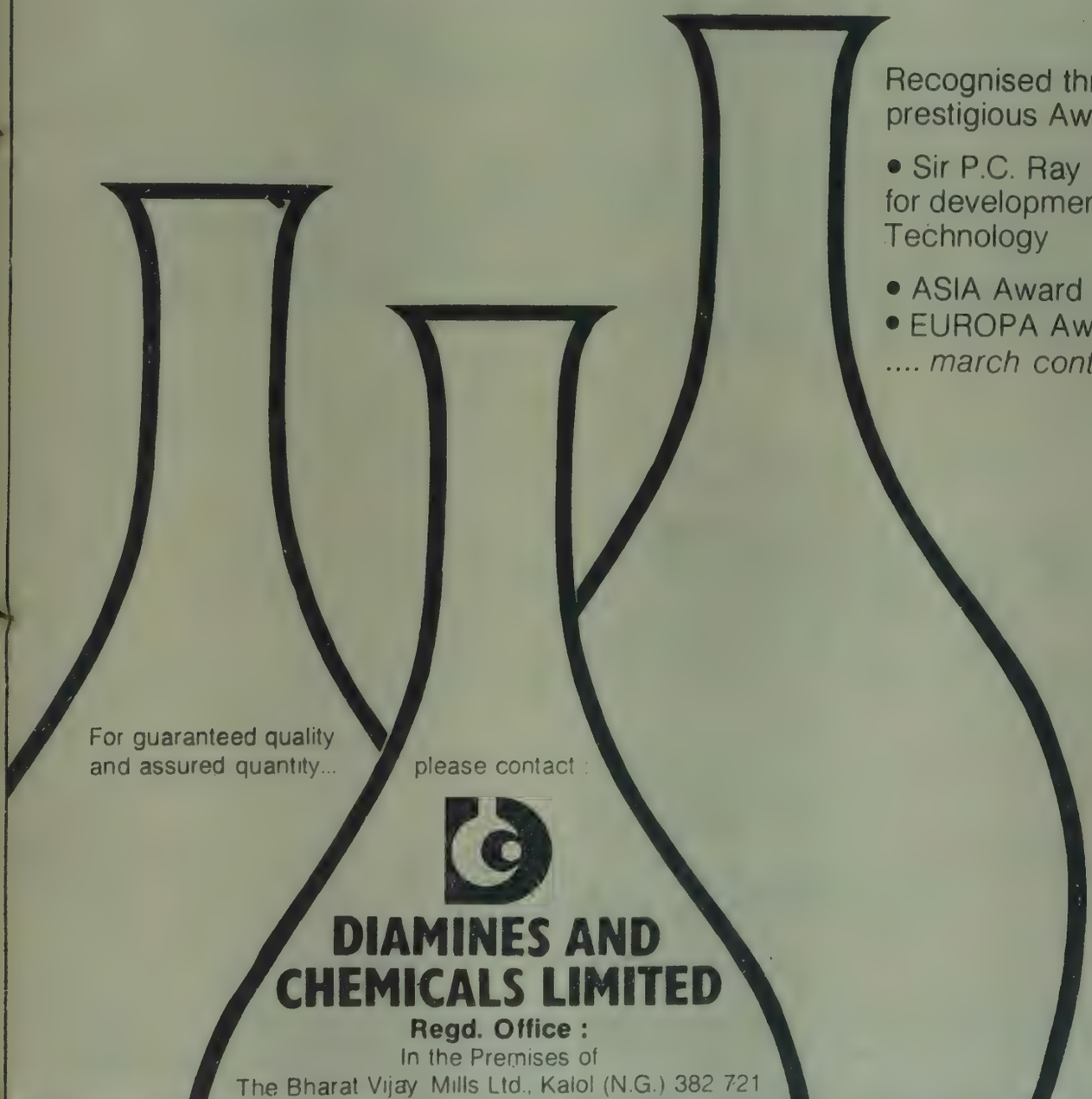
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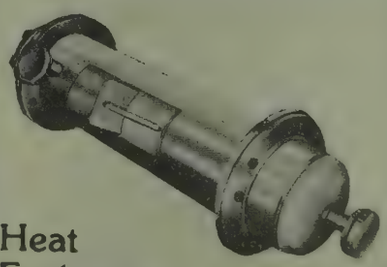
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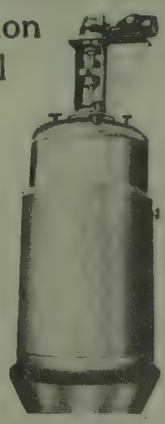
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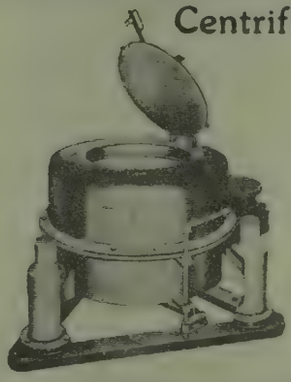
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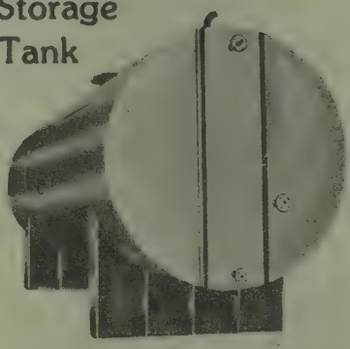
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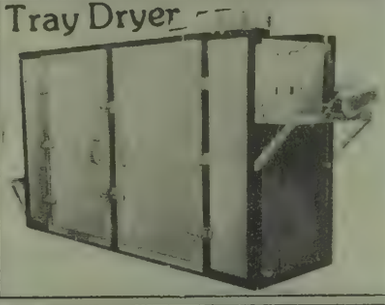

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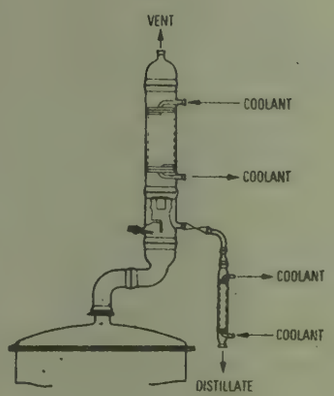
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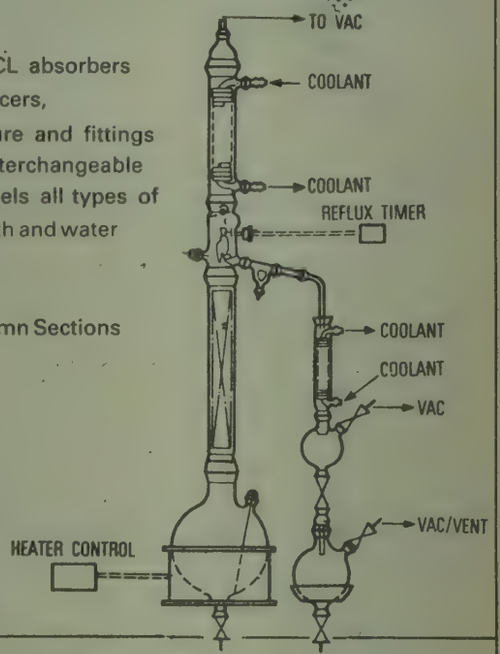
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CHEMICAL WEEKLY

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The Saddening Saga of Salt

Salt is a basic human necessity and an important raw material for the chemical industry with a host of applications, but this industry is relatively only of minor importance in the industrial map of India. Its importance to the national economy lies in the fact that it is labour intensive providing meaningful employment to a large number of people in the major States of the country and more particularly in the slack non-agricultural season.

Labour in salt manufacture is seasonal. During the salt season it touches a peak; but with the onset of the monsoon, when salt farming has to be suspended, workers revert back to the farms. The chief raw material required for salt manufacture -- sea brine -- and the energy source for evaporation into common salt -- solar heat -- are available in inexhaustible supplies.

Salt is a central subject, listed in the 7th Schedule. All aspects of the salt industry, such as its manufacture, distribution and supply, collection of salt cess, developmental activities connected with salt, maintenance and improvement of quality are under the purview of the Salt Department of the Ministry of Industry.

There are about 3,500 licensed and 7,100 unlicensed units all over the country, engaged in salt manufacture; all these units fall into four categories, namely licensees with operating area above 100 acres (Category I); Units between 10 and 100 acres (Category II) and licensees below 10 acres (Category III); the fourth category covers the non-licensed operators. Category one accounts for 70% of the area utilised and 60% of salt production. The non-licensed sector utilises 20% of area yielding 12% production. Thus the reasons for low productivity are obvious. Salt farming covers a total licensed area of 425,000 acres but only 55% of the area are utilised.

Generally speaking the yield of 45 tonnes per acre achieved in India is well below the figure of western countries. France and United States can boast of 5 to 10 times the Indian yield. The poor yield is attributable for the continued adoption of primitive farming methods and avoiding of mechanisation. Another matter for concern is the poor quality of salt manufactured in the country. The Indian Standards Institution has published seven different standards for adoption: (1) edible common salt, (2) salt for dairy industry, (3) salt for textile industry, (4) salt for chemical industry, (5) salt for cattle licks, (6) salt for analytical reagent and (7) iodised salt.

The chloride content of table salt has been fixed at 97% and of dairy salt 99.60%. Under Indian conditions, excepting for a very few large farms, the purity rarely comes up to the standard specification. The quality of the salt depends on the layout of the salt farm, and care taken to separate impurities during mining. Tests have confirmed that attention to layout and alignment of salt pans go a long way to improve the quality and yield of the product. Installation of washeries and refineries as also mechanised farming techniques are required if the Indian product has to conform to international standard in quality and yield.

Among the States, Gujarat is by far the largest producer of salt accounting for 63.3% of the national product. Tamil Nadu and Rajasthan (rock salt) account for 10% and 9% respectively. The non-licensed sector is dominant in Tamil Nadu. One disquieting feature of the growth of the salt industry is the diminishing importance of the co-operative sector. The total salt production in India has steadily risen from 27 lakh tonnes in 1980 to 101 lakh tonnes in 1986.

The present domestic demand is just about 72 lakh tonnes per year and the chances of its touching 80 lakhs in the next five years are bleak. Thus with the over production to the extent of 25 lakh tonnes per year for the past three years, the stock position of about 85 lakh tonnes at the end of 1987 has become dangerously high.

Salt is also used in a number of industries, particularly by the chemical industry for the manufacture of caustic soda. It is also used in canning, refrigeration, water softening, synthetic rubber, ceramics, etc. The caustic soda industry in India is plagued with problems of power cut and are working much below their installed capacity. The prospects of additional indigenous outlet for salt can be counted out.

Naturally enough, the only outlet for the excess production is export. Unfortunately there are major constraints in developing an export market. In spite of the industry's best efforts, it has not been possible to export even five lakh tonnes which figure includes export to Nepal and Bhutan of about one lakh

Rail movement of salt poses many difficulties. The main difficulty with the railways is that they are insisting on full rake movement of salt wagons. Further for the distribution of salt in the country, the Government has formulated a zonal scheme which restricts the movement of salt from a particular production area to a particular consuming area. The railways fail to appreciate that each individual salt manufacturer cannot get sufficient wagon quota to make up a full rake. Piece meal wagon allotment to small producers may somewhat ease the situation.

Gujarat is worst affected by this short sighted railway policy. Gujarat has three salt zones (1) via Kharegoda covering the salt works in the Rann of Kutch; (2) Jamnagar Zone for Salt works in Saurashtra and (3) South Gujarat Zone. The producers are pressing for merging all the three zones in Gujarat to one zone to provide some flexibility to the producers.

The hikes in the railway freight rate pose another problem. Thus for salt selling in bulk at Rs. 65 per tonne, the rail freight varies between Rs.250-300 in the case of movement from Gandhidham to North Eastern areas. Road transport is still costlier and has to be restricted only to short hauls.

The salt industry in India is passing through a crisis which in its scope, duration and severity is unprecedented and qualitatively different from any crisis witnessed in the past. The magnitude of the crisis is evident from the scale of year end stocks which has been rising steadily since 1984 -- 36 lakh tonnes in 1984, 47 lakhs in 1985, 63 lakhs in 1986 and over 85 lakhs in 1987. The current woes of the industry are attributable to the prevalent drought for the past three years. The recurring failure of the monsoon has resulted in undue prolongation of the salt season each year.

The poor showing with regard to exports is traceable to two factors; one, our inability to make salt prices competitive and two inadequate loading facilities at minor and even major ports. Salt is not entitled to any export incentive. Further there are undue delays in rail movement and delays in shipping. The pattern of salt consumption in India is very peculiar. In India the domestic sector accounts for the largest share (over 75%) and the balance is consumed by Industry. In developed countries like USA, the industrial sector consumes 75% and domestic sector only 5%.

While discussing the pricing of salt one cannot overlook the fact that in the Indian salt industry the potentialities for the possible by-products of this industry have not been tapped. Each year in the process of extraction of marine salt, millions of cubic meters of bittern are fed back into the sea. These are chemical rich solutions which contain magnesium sulphate, magnesium chloride, potassium chloride and bromine. The extraction of these by-products and their exploitation may help to lower the price of common salt.

The National Dairy Development Board (NDDB) has embarked on an interesting pilot project to develop procurement and marketing system for the benefit of the small salt manufacturers around Kuda siding in Surendranagar district of Gujarat. This pilot project would increase procurement and marketing in a phased manner reaching 50,000 tonnes in 2 years. This experiment holds rich promise for firming up the market for the small scale farmer.

The time is also opportune for the upgradation of the purity of salt for human consumption from 96% to 99% sodium chloride to bring it on par with the international standard. This course of action would help us to tap the sophisticated markets of Japan, Hongkong, Korea. Japan currently imports 6 million tonnes of industrial salt per year. If the Central and State Governments help the setting up of washeries for a cluster of salt works, there is every chance of India capturing a much wider share of the Japanese imports.

With more and more States being declared as endemic for goitre, salt has now become an essential vehicle for providing much-needed iodine to Indian households. About 140 million of the Indian population are reported to be exposed to severe iodine deficiency disorders and this figure may eventually touch 200 million by the end of the century. Salt fortified with iodine has become an absolute necessity to combat goitre. Extensive surveys have revealed that iodine deficiency is not restricted to any particular region in the country nor to any socio-economic group.

Against this background, one of the most ambitious and important health programme launched by the Central Government is the complete iodisation of edible salt by 1992. Under the new 20 point programme of 1986, the production of iodised salt is to be increased in a phased manner to a level of 30 lakh tonnes by 1990 and the Government is committed to provide 52 lakhs tonnes of iodised salt by 1992.

The trend in the output of iodised salt is positive but as a percentage of the total estimated output it is only 17.1% of the target for 1986. This shows the magnitude of the task that lies ahead in the matter of complete iodisation of edible salt. There are reports of a genuine need for iron fortified salt to control anaemia and other diseases caused by iron deficiency. This market is yet to be developed.

The present crisis faced by the salt industry is of a magnitude which cannot even be imagined. Even reduction in selling price has no effect since it does not get reflected in the retail price. The demand for edible salt is unelastic. There are talks of holding buffer stock. But there is no solution that can offer immediate succour to small scale operatives of this industry. The current hopes lie on a succession of good monsoons, so that the salt season is reduced.

The story of salt in India is an ancient one. It had a unique role in our Independence movement as Gandhiji chose salt as a major weapon to dislodge the British. It is indeed both tragic and ironical that an industry for which all the major inputs are freely available from nature and the skills required are elementary should have landed the manufacturers in such a dismal situation.

-- T.P.S. RAJAN

CHEMARENA

S.L. VENKITESWARAN

Ethanol from Hard Woods

Waste Cellulose or wood-based ethanol after hydrolysis and fermentation has been often advocated as a source of fuel but with not much success so far as a viable proposition. In USA maize or corn is a far more attractive proposition through incentives to the farmers. Of the cellulose sources, hard woods are more difficult to process. In this connection Bio Regional Energy Associates (BREA) of Floyd, Virginia, is serious in developing the hardwood alternatives which are plentiful in Virgina and nearby. Some information was given by the firm's President at an International Conference on (Fuel) Alcohols and Chemicals from Biomass held at Montego Bay, Jamaica. This company is building a 30 to 40 ton/day pilot plant to study wood hydrolysis. The three basic components cellulose, hemicellulose and lignin are to be recovered for market study. The indications are that cellulose may have other uses for its polymer value and not as a source of ethanol. But the outlet for polymer applications are limited and so a fair amount will end up as ethanol.

BREA is presently not producing ethanol but only dehydrating 95% product to the fuel grade. But a hydrolysis plant for starches with a capacity of 4 million litres has been set up and is to be expanded. Corn is a subsidised, price-volatile, weather-sensitive crop as compared to wood. Fluctuations in corn prices at $1.75 to $3.50 per bushel have no link to crude oil prices. Wet milling of corn leads to coproducts of food value and this is not possible with cellulosic materials. But the potential is there and BREA is funding a two year programme at Virginia Polytechnic.

It is generally agreed that the Stake Technology of "Steam explosion" of woody material developed in Canada is quite attractive. Even if the "exploded" product is not to be further processed to ethanol it has enhanced feed value equivalent to hay or can be combined with distillers grains (residue from grain-ethanol production plant). But more R & D on the use of lignin is necessary for more value added products. Perhaps it is too early to think in terms of ethanol from cellulose as a major industry but the next decade may witness changes.

Saving in inventory costs

A great advantage which USA and European (and perhaps Japan also) industry enjoys is the ready availability of almost all intermediates, raw materials and components. This enables uninterrupted operation with a very low inventory and the lower cost of keeping such a lean inventory. Even storage space is cut down. Indian Industry is invariably obliged to hold inventories of a few weeks requirements in the case of locally produced materials and of many more weeks in the case of imported materials. For imported chemicals like phosphoric acid, ammonia, butadiene, xylenes etc. tanker loads are to be contracted for import in advance and then stored in bulk at the port before transfer to the plant, sometimes a thousand miles way as in the case of butadiene imported by Synthetics and Chemicals. Indu Nissan imports the medium chain olefine for conversion to plasticizer alcohols. There are many other examples -- imports of methanol and ethanol etc. It is difficult to assess the extent in cost escalation due to this handicap which has arisen largely due to defects in our planning.

It is possible that the suppliers from abroad may be extending credits over an extended period. Suppliers of Indian products rarely extend credit unless under severe competitive market conditions or excessive supply over demand. There is now a further refinement in USA through what is called "just in time" deliveries and "direct vendor stocking" -- DVS at consumer premises if necessary. This DVS system became necessary when suppliers are a hundred miles or more away and Dow Chemicals have developed this type of arrangement and deliveries in time -- less than 24 hours. They have also linked the suppliers by computer and video displays planted at the vendor's warehouses. This eliminates the system of invoicing when a general contract is entered into. It is reported that Dow had 162,000 such DVS operations in 1986. Other companies have also entered

into "just in time" delivery contracts and saved substantial expenses on inventories. The cost of processing an order through computer link is extremely low compared to the conventional methods. It is time that this type of marketing arrangements be studied for adoption by Indian industry.

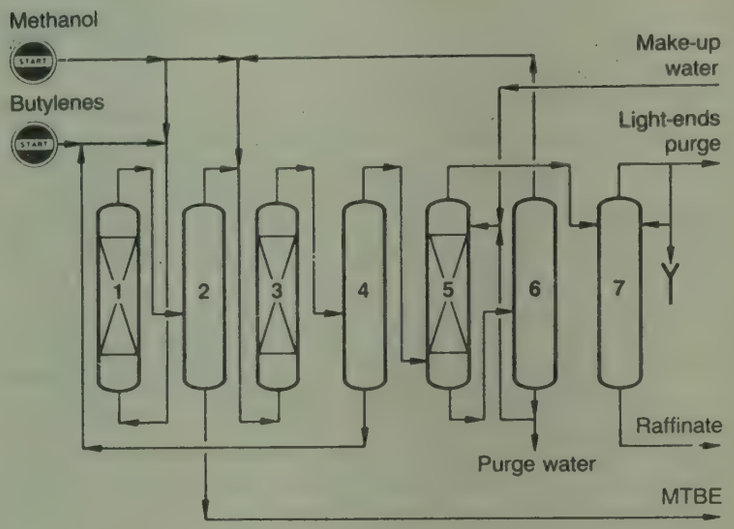
MTBE from Naphtha Cracker C_4 Stream

Naphtha cracker C_4 stream as a source of isobutylene to make MTBE with methanol (esterification) is now commercially operated. But so far the butylenes after butadiene extraction was used as it was feared that the presence of butadiene may be harmful to the esterification reaction using resins. However, a basic fact was in evidence that if the isobutylene was removed from the raw C_4 stream before butadiene extraction, then a richer feed with higher butadiene content will go into the extraction plant with resultant reduction in investment and energy consumption. Snam Progetti have therefore successfully modified their MTBE process to handle butadiene containing C_4 and this is operated successfully in a Hungarian plant.

The typical composition of butylenes from Steam Crackers are:

Severity	% by volume Low	Medium	High	Extra High
Butene-1	20.00	16.00	13.1	9.20
Cis Butene-2	7.30	5.20	2.8	0.54
Trans Butene-2	2.10	1.30	0.6	0.53
Isobutene	32.40	27.20	22.1	10.13
Butadiene 1-3	26.10	37.00	47.4	70.10
Butadiene 1-4	0.12	0.15	0.2	0.40

The high severity and ultra high severity cracker results in low levels of isobutene and very high butadiene content so that the recovery as MTBE may not be of any importance whether butadiene extraction is upstream or downstream of MTBE. The preferred case is of medium to high severity cracking with the stream containing about 22 to 27% of isobutene and 47 to 37% of butadiene. The changes in process of reaction with methanol were mainly to control butenyl ether formation. The reaction rates between butadiene and methanol were much lower and presented no problem. But acidic catalyst used for the reaction promoted oligomerisation of butadiene but this was controlled by temperature adjustments. Conditions were readily adjusted for selective MTBE reaction leaving butadiene unaffected. The methanol suppressed oligomerisation. The fouling of catalyst by sulfur compounds was also supressed by methanol. The reaction sequence is given in flowsheet and involves two stages of reaction and separation with recycle of methanol used in excess.



The product MTBE was over 99% pure and the feed C_4 and spent C_4 compositions are shown in Table.

Processed C_4 stream (wt %)	
C_3S	0.04
n-Butane	5.12
Isobutane	1.80
Butene-1	14.50
Isobutylene	22.63
trans Butene-2	6.16
cis Butene-2	3.66
Butadiene-1,3	45.74
Butadiene-1,2	0.22
Propyne	(32 ppm)
Vinylacetylene	(350 ppm)
Butyne-1	(210 ppm)
C_5S	0.10

Spent C_4 composition (wt %)	
Butadiene-1,3	50 to 70
Isobutylene	0.05 to 0.5
Other hydrocarbons	Balance
Dimethylether	(100-200 ppm)
Methanol	(< 5ppm)
MTBE	(< 5 ppm)
Water	(<150 ppm)
Inhibitor	(~60 ppm)

The capacity of the MTBE plant is 30,000 TPA when using a 23% isobutylene feed. Isobutylene conversion is higher than 98% and over 99.5% of butadiene is unaffected.

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R.C.F. Workshop on handling of chemicals

The Rashtriya Chemicals & Fertilizers Limited, conducted a one-day seminar on "Storage, Handling and Transportation of Hazardous Chemicals", in Bombay on April 13, 1988. The seminar was well attended by a number of fleet owners and personnel involved in handling and storage of chemicals. Mr. S. K. Sagane, Transport Commissioner of Maharashtra, was the Chief Guest at the function.

Welcoming delegates, Mr. U. N. Nayak, General Manager, R.C.F. noted that the workshop was necessitated by the large volumes of hazardous chemicals that RCF handled in its daily operations, and its commitment to see that such activity posed no risk to the public at large. Mr. Nayak observed that problems associated with storage/handling of chemicals arose largely due to the inability of most operators to take suitable steps in the event of an emergency. Mr. Nayak opined that the routes employed by tankers carrying chemicals deserved careful consideration. He further stressed the need for a statutory testing of tankers so as to ensure compliance with safety standards.

In his inaugural address Mr. S. K. Sagane, Transport Commissioner, noted that Maharashtra had been the first state in the country requiring tankers carrying chemicals to prominently display information on the shipment. A notification of the State Transport Authority now enumerates specific conditions for adherence by the carriers. These include, pictorial representations of any particular danger arising out of carriage of the chemical, display of the correct chemical name on the vehicle, etc. Further the driver is required to carry instructions in writing regarding aspects of first aid treatments, fire hazards and the like. A summary of these instructions in the form of a card, TREMCARD need necessarily be carried by the driver.

While admitting that much more needed to be particularly done with regard to licensing of drivers for transporting hazardous chemicals, Mr. Sagane noted that the steps taken by the government were in the right direction. He urged the chemical industry to respond in a more positive manner so as to tackle this problem.

In the presidential address Shri Duleep Singh, Chairman and Managing Director, R.C.F., noted that R.C.F. was conscious of its responsibilities to ensure smooth handling of hazardous materials. With this view in mind, R.C.F. had conducted a training programme for ammonia tanker drivers. A greater attention needed to be paid towards design of tankers for transporting chemicals, Mr. Singh felt. These tankers needed to be incorporated with built-in safety devices that would ensure that in event of any minor malfunction no major leakage or explosion occured.

Mr. Kuldip Narayan, General Manager, Industrial Products Division, proposed a vote of thanks.

The inaugural session was followed by two technical sessions in which the following papers were presented.

Statutory regulations connected with transportation of Hazardous chemicals. — Shri A. J. Rego, Dy. Director, NSC.

Warehousing & Storage of hazardous chemicals — Shri D. Venugopal, Manager, LPA.

Inspection, Testing and Maintenance of Tankers/Vehicles — Shri S. N. Prasad ACE Inspection & Corrosion RCF.

Safe loading and unloading practices — Shri S. Varadarajan, Addl. Chief Engineer, RCF.

Handling of Emergencies — Shri J. A. Solanki, Safety Officer, RCF.

IIChemE SEMINAR ON

Safety and loss prevention in industry

Within the last twenty five years the industrial plants have grown in size. The scale of possible fire, explosion and release of toxic materials has grown with the plant size. Also the area affected by such events has become much larger, thus affecting the population in the vicinity of these plants. With the heightened awareness of safety in general and for chemical industry in particular, it has become necessary to have an in-depth study of safety and loss prevention. Such a study of major and minor industrial accidents will result into an understanding of the various factors that lead to accidents and give guidelines for identifying potential hazards. Safety considerations will play a major role in selecting appropriate technologies, plant design, control systems, location and the training of personnel.

The Bombay Regional Centre of the Indian Institute of Chemical Engineers, which has a 1000 strong membership of Chemical Engineers, many of whom are decision makers at the highest levels in industry, proposes to organise a Seminar on May 6, in Bombay on this interesting topic. The areas covered will be broad-based and would relate to the identification and assessment of hazards in industry with particular reference to the Hazard and Operability Study and Hazard Analysis, Engineering for Safety, Training in Safety and Loss Prevention Society — Industry interactions and occupational health and medicine.

The Seminar is expected to have a wide participation from the entire strata of chemical industry including Industrialists, Corporate Planners, Development, Project and R and D Managers, Technology Experts from Industry, Equipment and Instrument Manufacturers, and Medical and Welfare Experts.

For further details contact: Dr. K. K. Tiwari, Chairman Indian Institute of Chemical Engineers, Bombay Regional Centre, C/o. Department of Chemical Technology, University of Bombay, Matunga, Bombay-400 019.

ETHYLENE IMPORT: TEAM FOR FRANCE, SAUDI ARABIA

The Union Government is going in for import of ethylene in a big way. An official team, headed by the Secretary to the Department of Chemicals and Petrochemicals, Mr. H. K. Khan, has left for a 10-day tour of Saudi Arabia and France to explore possibilities of importing ethylene to meet domestic needs.

The team will have preliminary talks with suppliers of ethylene in these two countries. The need for import of ethylene has arisen as the country is facing shortage of polypropylene (PP), high density polyethylene (HDPE) and low density polyethylene (LDPE).

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REMOVING TRADE POLICY LACUNAE:

Government should act fast

India will be able to end its trade deficit in the current year (1988-89), if only the government cares to remove a few short-comings in the provisions of its new import-export policy. If these short-comings are not removed the new policy may be able to end the trade deficit only by 1990-91.

Making this observation, Mr. Ramu Deora, president of the Federation of Indian Export Organisations (FIEO) and of the Basic Chemicals, Pharmaceuticals & Cosmetics Export Promotion Council (CHEMEXCIL) has said that the government should act quickly for removing all lacunae from the new policy.

He has expressed fears that the new policy's revised provisions for facilitating easy supply of intermediate products to downstream units of manufacturer-exporters might remain a non-starter if the shortcomings are not removed soon.

Elaborating further, he has said that FIEO had been pleading with the government for several years for treating the supplies made by one advance-licence-holder as 'deemed exports' and to provide them all export incentives which are available to physical exports." And the government has responded and revised the concerned provision. But in the process, it has introduced atleast four negative features into it, he has said.

These negative features are: (a) Denial of the benefit of such exports as a criterin for recognition of an export house; (b) Denial of the additional licence facility; (c) Denial of income-tax exemption under section 80 HHC; and (d) The reduced rate of CCS for 'deemed exports.' Removal of these features would lead to a total foreign exchange savings of about Rs. 300 crores immediately by way of surrender of advance licences, the FIEO chief has asserted.

Another new provision that would retard the export growth rate is the exclusion of 'deemed exports' altogether from the eligibility criteria of export houses. It is bound to prove a major impediment in the way of Indian industrial houses like Larsen & Toubro, Siemen, BHEL, Tata Engineering Consultancy, etc. seeking to participate in global tenders under the IDA, and World Bank aided projects. Such houses should not be denied certificate of eligibility as export houses and also income-tax benefits under section 80HHC, he has said.

Also, under the new policy, the denial of the special facility of supplementary import licences a third time to manufacturer exporters, despite their excellent export performance, would prove to be a "positive disincentive" to them.

In the country, presently there are no more than 500 such manufacturer-exporters and about 90 per cent of them are small-scale units exporting more than 25 per cent of their production. As such, the denial would mainly hurt the small units he has said.

There are other shortcomings too the new policy continues to be too rigid and stiffling in respect of disposal of the exempted materials imported against duty-free licences even after fulfilment of the export obligations. FIEO has been pleading that once an exporter manages to use duty-paid raw material in his exports and completely discharges his export obligation, he should be free to dispose off the exempt material in the market. Such material is apparently replenishment of that used in exports. But in the new policy, some relaxation has been granted for disposal of REP exempt material, and not otherwise.

Exporters seeking to sell such duty-free raw material to even actual users will, under the new policy, have to move the Chief Controller of imports and Exports (CCI&E) in New Delhi, with the accompanying cumbersome procedures. But surprising such a restriction is not there for those industrial units which are not exporters. Such units can freely select the purchaser of their choice and settle the price without having to go through the CCI&E.

The new policy has also totally ignored the need to provide some incentives to the Indian labourers toiling abroad remitting large sums of foreign exchange to the country. The government should be more considerate to them and give them some facilities for bringing home duty-free goods for their personal use. It is wrong to ignore the small man earning foreign exchange for the country, but making little demands, he has said.

The reduction in the period of registration of contracts from three years to one year or less, and the shifting of the cut-off date for claiming Rep benefits from the 'date of tender' to the 'date of actual contract' are some other drawbacks in the new policy, Mr. Deora has said.

WORKSHOP ON RESPIRATORY PROTECTIVE EQUIPMENT

The Indian Safety Engineering, Bombay in cooperation with Bombay Productive Council, Bombay has arranged a specialised training programme on April 26, 1988 at BPC Conference Hall, Rohit Chambers, 4th Floor, Ghoga Street, Bombay-400 001.

This specialised training programme will give theoretical and practical knowledge on Respiratory Protective Equipment; where to use, how to use, limitations and cautions to be exercised on each type of equipment. **Respiratory Protective Equipment saves lives** by their use on jobs requiring their regular use and on emergency leaks of toxic gases. While leaks of harmful or toxic gases should be prevented, it is not possible to eliminate them entirely, due to operating emergencies or equipment failures. One has to be ready to combat such emergencies with Respiratory Protective Equipment.

Fire Safety Experts from industries and Government organisations will discuss all important aspects such as Respiratory Physiology; Mechanical filter respirators; Chemical cartridge Respirators; Canister Gas Mask; Fresh Air Hose Mask; Air Line Respirators; Self contained Breathing devices; Allowable Breathing Air Contamination levels; Testing of Respiratory Devices and Demonstration of equipment.

For further details contact: "The Indian Safety Engineer", C/o. Hindustan Agencies, 3rd Floor, General Assurance Building, Dr. D. N. Road, Bombay-400 001 or Bombay Productivity Council, Rohit Chambers, Ghoga Street, Bombay-400 001. Delegates fees are Rs. 250/- per participant, by cheque or Demand Draft drawn in favour of THE INDIAN SAFETY ENGINEER.

Phones: BPC-2871764, 2870523, 2873757; ISE-2042641 Resi.: 5114543

RS. 287-CR. SODA ASH PLANT INAUGURATED

GHCL's soda ash plant opened

The President, Mr. R. Venkataraman inaugurated a Rs. 287-crore soda ash plant at Rudrapada near Veraval in Gujarat. The plant with a capacity of 1,200 tonnes per day, is jointly promoted by Gujarat Heavy Chemicals Ltd. and the Dalmias.

Speaking on the occasion, the President said the Government's aim in liberalising industrial licensing procedures was to encourage entrepreneurs and companies to set up their units with minimum controls and barriers.

Under the scheme, 17 chemical products, including soda ash, were included in this list and the Ministry of Industry was examining the question of adding more products to it, he added.

Laying stress on proper care of the environment by industries, Mr. Venkataraman said though the pollution control and industrial safety policy existed for quite some time, it had assumed greater significance after the ghastly tragedy in Bhopal which claimed hundreds of lives.

Mr. Venkataraman urged the industry to instal equipment to fight pollution, enforce bills to prevent accidents and ensure safety of workers and those living in the surrounding areas.

Lauding the 'tremendous industrial growth' in Gujarat in the last decade, he said it was adequate capital, abundant entrepreneurial skills and wise administrative policies which enabled the State come to the forefront in the country's industrial map.

Mr. Venkataraman said the Government had fixed minimum economic sizes for a large number of products. For soda ash, the minimum economic size is 3.3 lakh tonnes annually.

The President said he was happy to learn that the Gujarat Heavy Chemicals Plant has an annual capacity of 3.3 lakh tonnes.

He said with the liberalisation of industrial policy, the Government hoped that the industry would not only respond to the social needs of the people by providing at reasonable prices products essential for the small consumers but also increase exports to meet our foreign exchange need.

Making a reference about the severe drought in Gujarat for four consecutive years, Mr. Venkataraman said agricultural production and employment had suffered badly in the State.

He said he was happy to learn that the soda ash plant would provide direct and indirect employment to ten thousand families and would alleviate the suffering of the drought stricken-region.

Soda ash is used in the manufacture of glass bangles, textile & paper and is also used in the manufacture of chemicals like sodium silicate, caustic soda and photographic chemicals.

NEW PRODUCTS

Sejal Chemicals commenced manufacturing AURAMINE O (Basis Yellow 2) at their factory located at B-32, SIDCO Industrial Estate, Maraimalai Nagar, Chingleput District, Tamil Nadu-603 209.

At present three grades viz. 100%, 130% and 160% are available. The product is packed in 25 kg. M.S. Drums with polyethylene lining.

For further information contact: Sejal Chemicals at 106, Nainiappa Naicken Street, Madras-600 003.

CHEMOX DOES WELL

The Company has performed exceedingly well during the half year ended 31.1.1988. The turnover of the Company has increased 143% i.e. from Rs. 288.14 lacs to Rs. 411.58 lacs during the aforesaid period as compared to the corresponding period for the previous year. The profittability has also shown remarkable improvement over the corresponding period in last year. The profit before taxes has increased by 287% i.e. from Rs. 1.55 lacs to Rs. 4.45 lacs for the six months ended 31.1.1988.

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Carbon black shortage hits paint, ink units

Acute shortage of carbon black all over the country has put consuming industries like tyre, paints, printing ink, carbon paper, plastics, etc. to lot of inconvenience, according to consuming industries sources in Bombay.

The sources point out that carbon black, which was available in plenty and was, in fact, going abegging for want of consumers, has now become scarce suddenly.

Many units which are consuming carbon black, because of widespread severity of shortage, find no alternative but to close their units rendering thousands jobless.

While the sources allege that shortage was artificial and deliberately created by manufacturers by forming a cartel to reap windfall profit emanating from price rise consequent to shortage, manufacturers of carbon black, while admitting that there is a shortage of the commodity, ascribe the scarcity to non-availability of feedstock, supplied by Barauni and Haldia refineries in the north-east and Hindustan Petroleum in the West.

The sources say three out of four major carbon black manufacturers, Phillips Carbon, Gujarat Carbon and Oriental Carbon are owned by the Duncan group.

However, a spokesman of United Carbon said that Hindustan Petroleum, which supplied the raw material for carbon black from its subsidiary, Lube India, assured raw material since labour problem being faced by HP, especially in the carbon black feedstock section, has been overcome.

He further said Barauni and Haldia refineries in the north-east, which were also crippled by labour problems have now started regular supplies of carbon black feedstock since the problems have been sorted out with its staff.

However, he felt, it might take some more time before things normalised in Hindustan Petroleum and Lube India. This is because a dispute has arisen owing to excise people demanding a higher rate of duty before clearing the trucks for transporting feedstock for carbon black manufacturing units.

Until the excise controversy is settled, it is not possible to have uninterrupted supply of feedstock for carbon black manufacturers and shortage situation for carbon black consuming units may continue for some more time. But he expressed confidence that everything is bound to be normal soon. The worst phase seems to be over and normalcy will be restored soon, he added.

INDIA TO DRILL FOR OIL IN VIETNAM

India has virtually broken through as an independent explorer of oil overseas. A preliminary memorandum of understanding has been reached between Hydrocarbons India Ltd. (HIL), a wholly owned subsidiary of ONGC and Petrovietnam under which India will drill for oil in Vietnam on a profit-sharing basis.

Current negotiations, begun in 1985, are being given finishing touches with a Vietnamese delegation which is now in the country. All that remains is an okay by the Union Government. Once the Government gives permission, the contract will be valid for 25 years. There will be an initial six-year period which will be broken up into two phases. Petrovietnam will be the sole owner of the crude production.

At the outset, two wildcat wells will be drilled by HIL and while Petrovietnam will own all the production, HIL will share the profit arising from it.

If the production amounts to 10,000 barrels a day, the profit-sharing will be 50-50. With the production moving up, the profit-sharing ratio will gradually shift in favour of Petrovietnam. In an output of one lakh barrels, HIL's share will fall to 20 per cent. At no point, however, HIL's share will be less than 20 per cent, whatever the output.

A feature of the proposed contract is that HIL will conduct geological and geophysical work, including seismic survey, of the areas to be explored for crude.

India and Vietnam have been considering possibilities of co-operation in oil production for some years, and it was during the Indo-Vietnam Joint Commission meeting in 1985 that they decided to take concrete action.

ONGC has been assisting countries in West Asia, South and Central America in their programme of hydrocarbon exploration and exploitation. It has formulated a policy that some of its activities must be in other parts of the world not only to serve as a window to developing technologies but also to be able to export expertise and technologies.

The collected data about other basins in the world would enlarge India's data bank which is so vital to geoscientific studies leading to better interpretation of data in exploration ventures. In addition, this would help bring an increased element of quality, cost and time-consciousness.

ONGC has successfully carried out activities for the Iraq National Oil Company in land seismic survey and reservoir studies. It has also successfully executed a drilling contract in Songo Island for the Tanzania Petroleum Development Corporation.

ONGC and Abu Dhabi National Company (ADNOC) have entered into a contract whereby the former would carry out a study of the stratigraphy and hydrocarbon potential of Jurassic sequence of Abu Dhabi, ONGC would paid $ 1.43 million for the study.

Its other assignments included prospect evaluation of the Gulf of Mannar for Ceylon Petroleum Development Corporation completed in 1983 and training to engineers/scientists from Madagascar in 1986.

ONGC has also recently trained engineers from Bahrain National Oil Company (BANOCO) in advanced drilling technology at its Institute of Drilling Technology, Dehradun.

ICON, a consortium of public enterprises, has been formed with HIL as the lead agency of the consortium for taking up turn-key assignments outside India. The Overseas Operations Department of ONGC is also formulating and aggressively pursuing mutually beneficial co-operation proposals with Angola, Uganda, Sudan, Libya, Seychelles, Iraq and Malaysia, among a host of other developing countries.

ONGC has so far earned a profit of about Rs. 36 crores from its overseas operations, including exploration and

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UP small drug units facing crisis

The progress of drug manufacturing industry in the small scale sector in Uttar Pradesh has been bogged down due to manifold problems.

Among the major problems confronting the pharmaceutical units were high incidence of sales tax, excise duty on raw material, disparity in purchases by the Central Medical Stores Depot, absence of permanent drug controller and sale of sub-therapeutic drugs manufactured in other States in U.P. on a large scale.

Mr. N. K. Gupta, general secretary, Pharmaceutical Manufacturers Association, said that there has been no permanent full time drug controller in the State for the last two years causing inordinate delay in renewal of old manufacturing licences, grant of new licence and approval of narcotics etc.

He alleged that a large number of manufacturers in the States of Haryana, Rajasthan, Maharashtra, Bihar etc., were producing sub-therapeutic and half dose/low dose medicines against the required formulations and the same were sold in Uttar Pradesh. Since the manufacturers in U.P. were not permitted to manufacture sub-therapeutic medicines, they were unable to compete in the market. He demanded immediate ban on sale of sub-therapeutic medicines produced in other States.

There was no uniformity in purchases by Central Medical Stores Depot, which purchasss medicines worth about Rs. 12 crores per year, he said and added that bulk orders for purchases were being placed with public sector units and other firms without giving preference to small scale units in the State. Besides this, the payments were also delayed. Mr. Gupta wanted at least 40 per cent reservation for small units in government purchases.

He said that sales tax on medicines and drugs in U.P. was very high at 6.6 per cent as compared to other States adjoining States like Madhya Pradesh, Delhi, Himachal Pradesh, West Bengal, Manarashtra, Rajasthan etc. For example, sales tax on medicines was only three per cent in Madhya Pradesh and Maharashtra and 1.5 per cent in Himachal Pradesh. The Tripathi Committee has already recommended total exemption from sales tax on medicines and drugs. He said that in case it was not possible to abolish the sales tax and it should be reduced bringing at par with nearby States.

FACT EARNS PROFIT

The public sector Fertilisers and Chemicals Travancore Ltd. (FACT) has made a pre-tax profit of Rs. 15 crores during 1987-88.

This is the fifth year in succession that FACT makes profit. The company had already wiped out its entire accumulated losses last year.

Answering questions at a press conference on April 6, the FACT Chairman and Managing Director, Mr. N.B. Chandran, stated that the company is examining the rules in regard to declaring dividend. He, therefore, could not commit whether any dividend would be declared.

The ammonium sulphate caprolactam project, the ambitious diversification scheme of FACT, would be commissioned in January '89, informed Mr. Chandran. About 80 per cent of the work is already over. The project, the largest in the State has, however, to bear the brunt of substantial increase in the value of major foreign currencies, particularly Japanese yen.

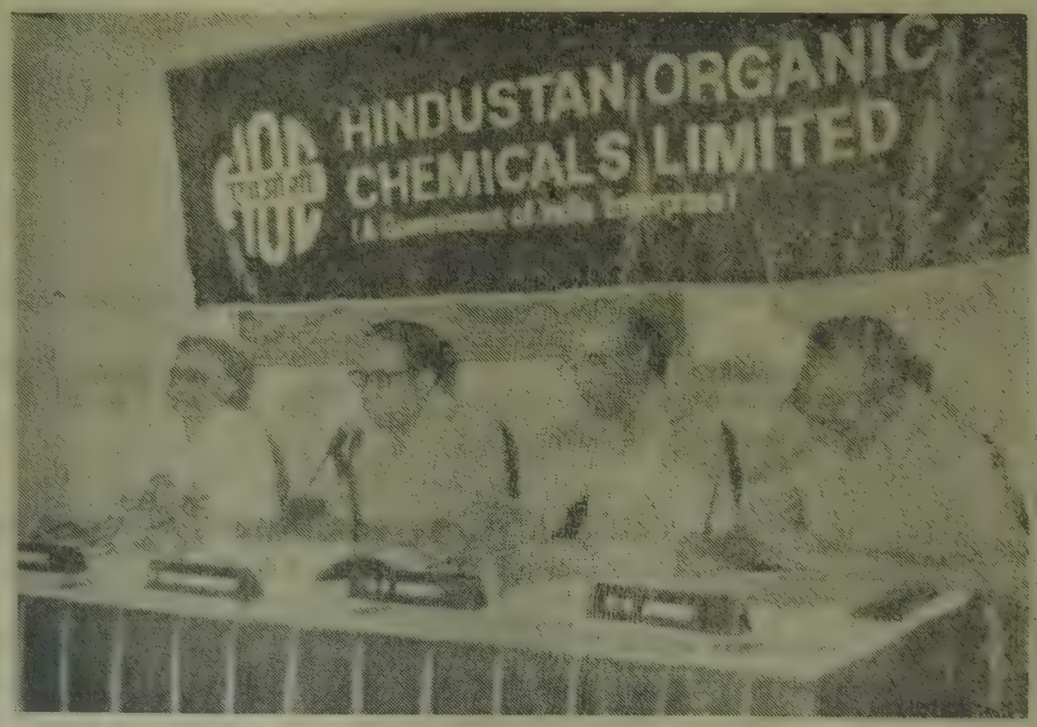
The impact of this coupled with the increase in the rate of customs duty pushed up the project cost from Rs. 260 crores to Rs. 315 crores. The project with a targeted capacity of 50,000 tonnes of caprolactam and 2,25,000 tonnes of ammonium sulphate when commissioned would help the country save foreign exchange to the tune of Rs. 150 crores every year through import substitution.

The slight delay in the commissioning of the project, which as per the original schedule was to have been commissioned by April 1988, is due to reasons and factors beyond the control of the FACT management, said Mr. Chandran.

Extensive repairs and revamp of the shop of the Giovanola Binny which has been taken over by FACT Engineering Works (FEW) recently are in progress. Plans for diversification of activities of FEW are also in the process of being finalised.

FACT has been selected by the Trade Dealers Club in Madrid for the second International Europe Award—1988 for excellence in performance.

HOC TO MAKE POLYURETHANES



Mr. H. Krishnamurthy, Chairman & Managing Director of Hindustan Organic Chemicals Ltd. (2nd from left) addressing the Press Conference. Others seated from L to R are Mr. V. K. Aundhe, Director (Finance), Mr. O. P. Nangia, Director (Technical) and Dr. B. G. Khare, Director (Commercial).

(A report on this proceedings has already appeared in CHEMICAL WEEKLY issue dated 12-4-1988.)

RETAIL TRADE MARGINS :

Chemists to challenge govt. notification

The All India Organisation of Chemists and Druggists (AIOCD) is moving the Supreme Court to challenge the government's fixation of retail trade margin at 16 per cent for price controlled drug formulations, it is learnt.

The government had issued a notification last month fixing the retail trade margin at 16 per cent and dropping the controversial proposed 50 paise as a fee for handling each prescription to the chemists during day time.

The chemists' contention is that the government has violated the agreement reached at the joint meeting of drug industry, trade and the government officials in December last on the trade margins issue.

In a package deal arrived at then, it was agreed that retail chemists would be given a uniform margin of 15.5 per cent for all price controlled formulations, a fee of 50 paise for handling each prescription during day time and Re one per prescription during night. These margins will also be on maximum retail price (MRP) inclusive of excise duty.

The government was to have effected these provisions in the Drug Price Control Order, 1987 immediately after the agreement was signed. Both the drug industry and the trade have been waiting for the notification since then.

However, the notification issued on March 22 has clearly stated that 16 per cent retail margin will be on MRP exclusive of excise duty. The government also dropped the proposal for prescription fee during day time to avoid additional burden on the consumers.

According to a spokesman of the AIOCD, fixing of retail trade margin at 16 per cent on MRP exclusive of excise duty would itself bring down the benefits to the retail chemists substantially.

It is to be noted that the government had originally fixed a trade margin of 17 per cent for ethical drug formulations and 15 per cent for non-ethical drug formulations in the 1987, DPCO, announced in August last. The wholesalers' margin was fixed at three per cent for both ethical and non-ethical formulations.

The retail trade margin was only 12 per cent for ethical drug formulations and 10 per cent for non-ethical formulations with only two per cent margin for wholesalers in the 1979 DPCO.

The drug industry had strongly objected to the steep hike in the retailer's margin with only a marginal increase in the wholesalers' margin in the new DPCO. In fact many drug units have been paying a wholesalers' margin upto six per cent under the 1979 DPCO.

Protests from the drug industry had made the department of chemicals and petrochemicals hold a series of meetings with the representatives of drug industry and trade before the December meeting, where an agreement was reached.

LETTER TO THE EDITOR
EXCISE ON DRUGS

Mr. Puranjit Mukherjee, Calcutta writes:

The recent budget may have made it appear as though the prices of medicines will be cheaper as a result of the exemption of excise duty. Unfortunately, I find the picture is entirely different from what has been highlighted in the banner line while poring over the full text of the budget.

Though it is true that the drugs of category-I which are directly used for TB, malaria, filaria, leprosy etc. have been fully exempt from excise duty by budgetary announcement, this announcement has a dark side too.

The prices of several thousands of drugs which are normally frequently used by us in our day-to-day life are bound to increase substantially due to the new imposition of a 5 per cent central excise duty on all bulk drugs (other than category-I) which were not subject to excise duty before. Further, in some cases an additional 5 per cent customs duty has been imposed on intermediates used to manufacture some essential bulk drugs.

Now as per the recent amendment of the drug price control order the government has already allowed drug manufacturers to increase their prices. It is natural that the finished product price is directly co-related with the bulk drug price. So it is obvious that the prices of all other drugs which cover 80 per cent of the total formulations are bound to increase substantially for the fresh imposition of customs and excise duty.

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Pesticides formulators protest patent law modification

The Pesticides Formulations Association of India in a representation to the Jt. Secretary, Ministry of Commerce, Government of India, have protested against the Central Insecticides Board's plan to amend section 9(3) of the Insecticides act to provide protected registration for five years to the first registrant. The following is the text of the representation submitted by the association.

Sub : Backdoor introduction of Paris Convention (Patent Act) by Amendment in Central Insecticides Act Section 9 (3) to give protected Registration to the First Registrar (Manufacturer) for 5 years which restrict introduction of the said product by 2nd Manufacturer and withdrawal of Repeat Registration Under Section 9 (4) for the same Period.

Dear Sir,

We understand that Central Insecticides Board is considering to amend the C.I. Act with regards to the registration of the product under Section 9 (3). At the moment once the product is registered under Section 9 (3) repeat registration is available to the 2nd manufacturer immediately if the products are same with identical data and chemical composition. Now central Insecticides Board is thinking to give protected registration U/S 9 (3) for 5 years to the first registrant which will restrict other manufacturers to get repeat registration U/S 9 (4) this will create monopoly for the first registrant and it will result in exploitation of the farmers by charging high rates because of monopoly and protected registration under section 9 (3) to the first manufacturer. We would like to put forward various points for your valued consideration and we request you to advice the government not to amend the Act, as it is not in the interest of the farmers and the country.

(1) Backdoor introduction of Patent Act by Amendment in Central Insecticides Act Section 9(3) to give Protected Registration to the First Registrant (Manufacturer) for 5 years which Restrict Introduction of the said product by 2nd Manufacturer and withdrawal of Repeat Registration Under Section 9(4) for the same period.

In India under the present Patent Act no product patent is granted for products relating to medicines, food and chemicals. It is also clarified that chemicals includes alloys, optical glass semi conductors and intermetallic compounds which are produced by chemical process. This Act has in the past helped in areas of medical health and also in agriculture.

The argument that, because no patent is available of agricultural chemicals, is coming in the way of bringing new products is absolutely incorrect. As a matter of fact today India has developed enough expertise to develop any new chemical without the help of foreign technicians. This has been achieved only because the product patent and protection was not given to new products in India. It has been proved that India can produce any new agro chemicals (Pesticides) of better quality and cheaper than multinational companies who claim their patents.

The poorest farmers in the world are in India and to get a better output of the agriculture produce we need more pesticides which are cheaper and within the reach of the poor farmers of India.

Whenever there is a monopoly of pesticides, it has been noticed that multinational companies exploited the situation. We have examples of many pesticides like Fenvalerate, Cypermethrin, which when they were imported, were very expensive, but after Indian companies have started manufacturing and supplying to the Indian farmers and exporting these multinational companies have reduced their price to nearly 1/3rd or 1/4th of their earlier selling price in the world.

In some of the pesticides, we are told that India has done great service to developing countries (Mexico, Pakistan, etc.) by offering reasonable prices.

It has been noticed that even in other countries where there is no patent these multinational companies are having a cartel and exploiting these poor farmers in the developing countries. We can give a number of examples, in countries like Pakistan, Mexico and Africa, they are selling

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these pesticides at 4 times the export price to other countries. They have cartels and monopolies.

If we give a patent protection to some of the big multinational companies there is very big risk that the situation may be exploited by them. There are a number of examples where a number of multinational companies have been caught exploiting the monopoly and charging exhorbitant price to the customers. Some of the leading companies in U.K., Switzerland and USA have paid heavy penalties because they were caught over charging the consumer.

If patent protection is given to them, these big companies are bound to exploit the poor Indian farmers. In Western countries, there are systems by which they can check and punish the guilty, but in India we may find it very difficult to punish the exploiting companies as our administration is not strong enough to catch them. Our MRTP Act does not provide penalties for cartel. They can only order them not to do it again.

As in India at present Patent Act there is no product patent many multinationals are trying to introduce Patent Act in Paris Convention by backdoor introduction of Patent Act by way of amendment in Central Insecticides Act particularly Section 9(3) of registration and we would like to request government not to amend the Act or to suspend the grant of registration U/s 9(4) for repeat registration once the product is registered U/s 8(3).

(2) Misuse of protected registration with regards to the price of pesticides and monopolisation of the product which results in higher price of the formulation

We represent small scale pesticide formulators of India which are widespread in each and every district and taluka of India serving Indian farmers by making various pesticides available at very competitive price within the reach of Indian farmers. SSI units are getting their Central Insecticides Registration for the various products under Section 9(4) on the basis of the repeat registration as soon as any product is registered under Section 9(3). New pesticides are registered by various large scale and multinational companies under Section 9(3) b under provisional registration and within 2/3 years they register the said product under Section 9(3) for permanent registration. Once the product is registered under Section 9(3) for repeat registration under Section 9(4) is allowed for other registrants as and when the applications are received. We understand that Govt. feels that due to repeat registration U/s 9(4) new pesticides are not brought or introduced in India by various Multinationals and large scale unit which is totally false and completely wrong. If there is potential market for any pesticides nothing can prevent multinational companies from introducing or registering the said products in India for e.g. case of synthetic pyrethroids such as Fenvalerate and Cypermethrin, they were introduced by Multinationals in the year 1982-83 and the product was registered under Section 9(3) and later under Section 9(4). When the product was registered under Section 9(3) b provisionally it was indirectly one kind of protected registration issued by CIB and during the period of registration U/s 9(3) B Fenvalerate 20% EC was sold by these multinationa's at the rate ranging from Rs. 500 to Rs. 600 per litre and Fenvalerate Technical at Rs. 1,000 per kg. subsequently in 1983-84 U/s 9(4) 5 to 7 registrations were issued to medium and SSI and the rate of Fenvalerate 20% EC came down to Rs. 400 per litre and Fenvalerate Technical Rs. 850 per kg. again in 1984-85 and 86 further approximately 30 registrations were issued U/s 9(4) for Fenvalerate 20% EC and Fenvalerate Technical which resulted in a further fall in their prices. Today the market rate for Fenvalerate 20% EC is Rs. 200 per litre and Fenvalerate Tech. at the rate of Rs. 635 to Rs. 650 per kg. You are requested to go through the said statistics very carefully. The above facts will definitely convince you that the protected registration issued under CIB Act always provides monopoly and exploitation right to the first registrant. The price difference today for Fenvalerate EC is more than 100% for Fenvalerate Tech. 20% which is a sizeable difference and the benefit goes to the Indian farmers because they get the product at very cheaper rate from Indian Small Scale industry. This is only one example which are citing but the same is in the case of Cypermethrin Technical. In 1984 when Cypermethrin Tech. was introduced by multinationals under protected registration the technical material was sold at Rs.

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2,200 per kg. and Cypermethrin 25% EC at Rs. 900 per lit. The moment Central Insecticides further issued registration U/s 9(4) to Indian Small Scale industry approx. 10 to 15 registrants the price of Cypermethrin came down as follows Cypermethrin Tech. is available at Rs. 1850 per kg. and Cypermethrin 25% EC is available now at Rs. 575 to Rs. 600 per litre. These are the examples which will give you an idea for amount of damage monopolisation and exploitation done to the Indian farmers if protected registrations are issued U/s 9(4) to small scale industry the price of pesticides is brought down to the extent of 30% to 40% and sometimes to the extent of 100% (as in the case of Fenvalerate 20% EC) if our Govt. wants to really benefit the Indian farmers they should not allow any protected registration U/s 9(3) as stated in the press note. We also like to add here that the cost of raw material, packing material and layout has increased during the last 3 years and also excise duty S.T. and other levies are increased substantially. Inspite of all these increases the cost of pesticides formulations specially Fenvalerate and Cypermethrin has decreased during the last 3 years. We hope you will understand the way in which Indian farmers were exploited by multinational companies in 82-84 by paying higher price for the said products. The moment repeat registrations were issued to SSI sector in 85-86 the price fell from 30% to 100%. You are requested to please take a note of this. So we strongly object for this amendment in the Act with reference to Section 9(3) and 9(4) without giving us an opportunity to be heard in person.

Non Utilisation of Spare Capacity

As Govt. of India knows very well the pesticide formulation industry is over licensed. Therefore Govt. of India has stopped new manufacturing licence under DGTD or to Small Scale sector since 1973 onwards. The said industry is a banned industry for new capacity. At the moment in SSI sector capacity utilisation is hardly 30% to 40% in respect to installed production capacity. SSI units are trying their best to utilise their idle capacity, by obtaining more registrations for new product U/s 9(4) on repeat registration basis. If Central Insecticides act is amended and the product is registered U/s 9(3) under protected registration and if further registrations are not issued U/s 9(4) then new product will not be available to SSI units which will result in further idle capacity of the industry. In our industry every 2/3 years new pesticides are being introduced and old products are fading out, and if the protected registrations are given to the first registrant there will not be any rdgistration given for further 4 years U/s 9(4) and SSI units not be able to manufacture new pesticides. This will add to idle capacity and also the farmers will be at the mercy of multinationals which will control the market price and product availability throughout India. Inspite of having SSI units in each and every district the product will not be available freely with the farmers. So we feel that protected registration will add to the idle capacity of industry and further there will be many units who will have to close down their operations if the above act is amended.

Foreign exchange earnings and export

We also like to state that if the product is registered under protected registration and if the first registrant is a multinational Co., it will definitely monopolise the entire manufacturing and marketing of the said product and will not export the said items from our country, the reason being that their principals abroad meet the export requirement of the said product and they will not allow any of their subsidiaries of branches to export the products from India. This type of protected registration will therefore completely stop the export of pesticides and not a single Indian company or small scale industry will be able to export any pesticide for a period of 4 years under protected, registration resulting in declining in export under protected, registration resulting in decline in export earnings and foreign exchange. So we strongly protest against the protected registration and amendment of the Act.

(3) Opinion of Prime Minister Mrs. Indira Gandhi, Former Vice President and Ex Chief Justice of India

We would like to request to Govt. of India to refer to old records where it states that the idea which struck our late prime minister Mrs. Indira Gandhi when she was alive, as she told the World Health Assembly in Geneva in May 1982, 'The idea of better-ordered world is one in which medical dis-

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The former Vice President and Chief Justice of India, M. Hidayatullah, one of the country's most distinguished justice and a man seldom given to overstatament of any sort, has this to say of the Paris Convention:

'It cares little for need for social change which is the crying need of developing countries and does not speak in terms of public interest.... With its rules of priority.... (it) will tend to wither local industries.

Hidayatullah is not alone in his opinion. Former Chief Justice of India Mr. Y. V. Chandrachud, says he has no doubt that accession to the treaty will 'impair seriously the growth of indigenous Indian industries.... The Paris Convention will thus result in the checking of Indian industries and the flooring of the Indian market by patented goods manufactured in foreign countrias by multinational companies.

(4) Fair Competition

At the moment in absence of product patent there is healthy competition amongst Technical Grade Pesticides manufacturers, manufactured by Indian Chemical Industries with multinationals operating in India. The moment any new compound is manufactured in the world and are likely to be introduced in India, Indian companies are capable of producing the said techical grade pesticides within the given time of 6 to 12 months. For e.g. Synthetic Pyrethroid such as Fenvalerate Tech, Cypermethrin Tech, Decamethrin Tech, Isoproturon (Herbicide). Phorate, Endosulfan., Due to fair competition Fenvalerate 20% EC when it was introduced to the farmers in India was sold in 1985 at approx. Rs. 600/- per liter when there were hardly 1 to 2 manufacturers for the said commodity with the progress of time many Indian companies started manufacturing the said product and price was brought down to 185/- to 200/- rupees per litre. If required we can produce necessary documentary evidence and as you know in last 3 to 4 years cost of all inputs, govt. taxes packing material and wages have gone up whereas the cost of Fenvalerate has gone down which itself is self explanatory to our strong case to have fair competition in the market by net patenting the product and our present Patent Act does not require any amendment.

(5) Role of National Chemical Laboratory, C.S.I.R. & Regional Research Laboratory

As India has already advanced in Chemical Industry, today our technocrats and scientists are in a position to manufacture a particular pesticide and make it available to the farmers. Even our National Chemical Laboratory, Regional Research Laboratory, Hyderabad, Jorhat, are developing a process to manufacture a new pesticide and if the product patent is given then there will be a definite end to the use of all the Indian talents and scientists who would come to a grinding halt. To give an example, when Fenvalerate was manufactured by one Company and imported the prices were about Rs. 600 to Rs. 650 per lit. and today with fair amount of competition and more than one manufacturer making Fenvalerate the price has come down to Rs. 185 to Rs. 200 per litre. That means a saving of 100% to the farmers.

As you know R.R.L. & N.R.D.C. are capable of develcping any technical knowhow for chemicals and technical grade insecticides within given time of 6 to 12 months for any new product. For your ready reference our govt. Laboratory R.R.L. has provided technical knowhow to the following multinationals.

(1) M/S. Hindustan Ciba Giegy.
(2) M/S. National Organic Chemicals Industries Ltd., formely (Shell) Interrationsl)

and many others which includes also Indian companies like Sudarshan Agrochemicals Ltd, M/s. Bharat Pulverising Mills, M/s. Excel Industries Ltd. If any change in Patent Act or patent protection of 14 years are given then this laboratory will not be able to contribute any development to chemical industries in India. Scientists employed in the above laboratories and entire infrastructure which has been created by great effort, in a period of time, will be totally a waste as multinational industries new product in the country will be protected for 14 years which will not promote this laboratory to develop any knowhow for Indian manufacturers or enterpreneurs.

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(6) Grant of Patent Product

If any product patents are granted it will be harmful to the farming community as there will be one source of supply for 14 years (Patented Period) and manufacturers will definitely have monopoly and they will charge any price which they like. It will also result in monopoly & restrictive trade practice which govt. of India does not promote or agree.

(7) Disadvantage of Patented Product Thimet 10-G

Let us consider Thimet 10-G (Phorate Granules) which are very effective granular insecticide for rice, cotton, vegetables and today with Patent U.S.A. only 1 company is marketing Thimet Granules and are charging their own price whilst in India there are 3 manufacturers of technical and more than one dozen formulators by which prices have come down and the farmer is getting Phorate Granules at very reasonable rates.

(8) Waste of Foreign Exchange

If patent Act is amended and Paris Convention is signed it will give protection to the foreign & multinational manufacturers for 14 years & it will result in heavy drain of foreign exchange by way of imports royalties on patented product which would inflate nation's import bill to unimaginable proportions. The monopolistic rights it would confer on the multinationals of developed nations which use technology as an instrument of both income & exploitation would liquidate the present multichannel imports option that the country exploits, and force the purchase of products from patented countries, very often at prices much as 500 percent higher than those currently obtaining.

The Indian Patent Act has ensured lower prices of medicines in India, compared to Western countries which are members of Paris Convention. In a comparative study of the retail prices of 54 drugs, it was observed that world prices of most of these drugs were 100 to 200 percent higher than the prices in India. Today per kg cost of bulk drugs like Temoxifen and Tobramycin is US $ 3000 when purchased from non patented countries. If India were to purchase the same item from patented countries which she would have to on acceding to Paris convention they would cost US $ 15,000 for just one kilogram.

(9) Restriction of Imports

We feel that the moment Central Insecticides Act is amended in Section 9 (3) for protected registration the entire inputs of pesticides technical material as well as formulation will be a monopoly of the first protected registrant. Once the product is registered by a company, no other Indian company will be able to import the said pesticides or market the said pesticide formulations in domestic market. Protected registration will allow free hand to the multinationals to monopolise the product & to exploit the market by charging higher price to the farmers because there will not be any local competitors from SSI pesticides unit nor from Indian pesticide manufacturer from large scale units. So we feel Govt. should consider this very seriously and they should look into each and every aspect of the said amendment before they take any action in this regard. Our Association is representing 160 manufacturers in Small Scale Sector these are situated all over India and spread over in various districts in every state. We hereby request your valued department to grant us a personal interview and give us your valued time to discuss the above matter & hear our various difficulties in this regard & our view points with regards to the amendment in Central Insecticides Act for protected registration. We hope you will definitely give us an opportunity to represent your case and we request your valued office not to take any decision in this regard unless and until we are heard personally to express our views in detail.

TOILET SOAPS UNDER FDA LICENCE

The liquid toilet soap and toilet soap cakes are required to be manufactured under licence issued by the Food and Drugs Administration, as these items were included in the definition of cosmetics since 1983 as per the provisions of the Drugs and Cosmetics Act, according to the joint commissioner, Food and Drugs Administration, Bombay.

Institutions inviting tenders for these items have been advised to accept tenders only from manufacturers possessing the licence. Consumers should also take note of this, the release added.

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SHAHJAHANPUR FERTILISER PROJECT :

FCI stakes claim

The Fertiliser Corporation of India Ltd (FCI) has also thrown its hat in the ring and staked its claim to build the Shahjahanpur gas-based fertiliser project. The two co-operative sector fertiliser giants, Iffco and Kribhco, are already in the fray.

FCI has written to the government seeking permission to put up the plant, the letter of intent for which was earlier given to the Shiram group and then to the Caparo group of the famous non-resident indian, Mr. Swraj Paul.

Alternatively, FCI has suggested to the government, the H-B-J pipeline should be extended to Gorakhpur where it has a fertiliser plant which is suffering losses for the past few years. The cost of the additional pipeline is estimated at Rs. 150 crores. The new plant can be put up there and the old plant scrapped.

The FCI management is understood to have told the government that since the corporation has all the infrastructure for the fertiliser plant at Gorakhpur, the cost of putting up a gas-based fertiliser plant there would come down considerably. The Corporation has also believed to have told the government, that land, trained manpower and water is available in plenty in Gorakhpur. Power being in short supply, the Corporation has indicated its willingness to put up a captive power plant at the project site.

The management is also believed to have indicated to the government its inability to provide any funds for the project, its internal resource generation being only next to nil. The government will have to give the corporation budgetary support to put up the plant, in case it decides to give it to FCI.

Built with a capital investment of about Rs. 35 crores, including a foreign exchange component of Rs. 14.4 crores, the naphtha-based Gorakhpur fertiliser factory went into production on January 1, 1969.

It had then an installed capacity to produce 350 tonnes of ammonia and 543.5 tonnes of urea per day which meant an annual production of 1,74,000 tonnes of urea or 80,000 tonnes of nitrogen.

Toyo Engineering Corporation of Japan was the supplier of the main plants, and detailed design and engineering were done by the then planning and development division of FCI (now PDIL) which also procured some of the ancillary plants and facilities.

For making urea, Gorakhpur employed the Toyo Koatsu complete recycle process.

In 1976, a Rs. 18 crores expansion project was completed which enabled the Gorakhpur unit to increase its ammonia capacity to 570 tonnes and urea to 950 tonnes per day. The expansion project was mainly based on utilising the idle capacity of standby equipment and machinery available in the plant. Major additional equipment required were the carbon scrubber system, carbon monoxide conversion unit, and carbon dioxide purification unit based on Benefield process alongwith MEA and caustic scrubbers, air separation and nitrogen wash unit and ammonia synthesis unit. In the urea plant, one train decomposition and recovery unit alongwith the prilling tower were added.

In addition, an argon gas plant was also put up at a cost of Rs. 70 lakhs.

NEW METHOD TO ENRICH URANIUM

Japan's Institute of Physical and Chemical Research has succeeded in developing the world's first uranium enrichment technique using the molecular laser method.

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GAS-BASED FERTILISER PLANTS :

Three projects likely to be delayed

The fertiliser department of the agriculture ministry has claimed in its 1987-88 annual report that the gas-based fertiliser plants at Babrala and Shahjahanpur will be completed in mid-1991.

The report says that the projects at Vijaypur, Aonla and Jagdishpur are progressing as per schedule. They are expected to come up by mid-1988. There is, however, some delay in the implementation of the projects at Sawai Madhopur, Babrala and Shahjahanpur.

For Sawai Madhopur the government had recently approved the process licence and technical service agreement with foreign collaborations subject to certain modifications. The zero date for the project, therefore, is expected to commence as soon as agreements are sent to government for taking on record and the promotors obtain environmental clearance.

The report says that the other two projects at Babrala and Shahjahanpur are at preliminary stages of implementation. It is anticipated that the Sawai Madhopur project will be completed by the end of 1990 while Babrala and Shahjahanpur in mid-1991.

The report says that planned development of the fertiliser industry over the last three decades has considerably bridged the gap between indigenous production and demand of fertilisers.

Production capacity, which increased from 0.85 lakh tonnes of nitrogenous and 0.63 lakh tonnes of phosphatic fertilisers in 1961-62 to 70.33 lakh tonnes of nitrogenous and 22.63 lakh tonnes of phosphatic fertilisers in 1987-88 has made India a front ranking fertiliser producing country.

The report says that a large expansion programme of 15 projects — eight nitrogenous and seven phosphatic fertiliser, new or expansion units — is in the pipeline which when completed will raise the capacity to 84.44 lakh tonnes of nitrogenous and 25.90 lakh tonnes of phosphatic fertilisers by 1989-90.

The report expected 54.30 lakh tonnes of nitrogenous and 16.60 lakh tonnes of phosphatic fertilisers to be produced during 1987-88. During this period capacity utilisation of 77 per cent is expected to be achieved by the industry.

Growth in capacity as well as production of fertilisers during the first three years of the Seventh Plan has been substantial both in absolute and percentage terms. Installed capacity rose from 55.70 lakh tonnes of nitrogen and 15.72 lakhs tonnes of phosphates in the last year of the Seventh Plan to 70.33 lakh tonnes of nitrogen and 22.63 lakh tonnes of phosphates in the first three years of the plan marking an increase of 27.52 per cent in nitrogen and 43.96 per cent in phosphates.

Similarly, production is expected to go up from 39.17 lakh tonnes of nitrogen and 12.64 lakh tonnes of phosphates in 1984-85 to 54.30 lakh tonnes of nitrogen and 16.60 lakh tonnes of phosphates during 1987-88, the percentage increase in production being 38.62 per cent for nitrogen and 31.33 per cent for phosphates.

According to the report, during the year, production has started in one new nitrogenous fertiliser plant of Hindustan Fertilisers Corporation at Namrup.

The Seventh Plan envisages a capacity of 92.53 lakh tonnes of nitrogen and 26.91 lakh tonnes of phosphates by 1989-90, the terminal year of the Seventh Plan.

The demand for nitrogenous and phosphatic fertilisers is projected at 91 lakh tonnes of nitrogen and 30 lakh tonnes of phosphates at the end of Seventh Plan which is expected to increase further beyond the Seventh Plan period also. In order to contain the gap at a reasonable level, preliminary work for creating additional fertiliser production capacity has been taken up in the Seventh Plan period itself.

(Contd. on p. 55)

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Nitrogenous fert. output may touch 5.3 M. T.

Production of nitrogenous fertilisers in 1987-88 is expected to be 5.43 million tonnes, marginally higher than the previous year's production.

The production during the year would have been much higher but for equipment problems, power cuts and water shortage, and less offtake on account of the widespread drought, says the annual report of the Fertiliser Ministry for 1987-88.

Production of phosphatic fertilisers during the year is expected to be 1.66 million tonnes, almost the same as in 1986-87 despite acute shortage of imported phosphoric acid.

The report says there has been a steady increase in the capacity utilisation of fertiliser units and the overall figure for 1987-88 is likely to be more than 77 per cent.

Referring to the gas-based nitrogenous fertiliser plants to be set up in the current Plan, the report says of the total of six, three are likely to go on stream by the middle of this year. Work on the other three plants is at various stages of implementation and the projects are likely to come up by 1990-91.

The six phosphatic fertiliser projects, which would be contributing the additional capacity in the current Plan, have also been either taken up for implementation or are in the process of being taken on hand.

With the pre-project activities already completed for the new plants to be established during the Seventh Plan, no slippage is anticipated in the achievement of the Plan targets.

The report says the demand for nitrogenous fertilisers by the end of the Seventh Plan is estimated at 9.1 million tonnes and for phosphatic fertilisers at three million tonnes.

Referring to the fertiliser subsidy, the report says it has increased from Rs. 275 crores in 1981-82 to Rs. 2,050 crores in 1987-88. The budget provision for this purpose in 1988-89 is Rs. 2,750 crores.

During 1987-88, up to December, a total of 685,000 tonnes of fertiliser nutrients have been imported to meet the gap between indigenous production and demand.

For construction of fertiliser plants, the report says 70 per cent of the equipment required can at present be produced indigenously by the engineering and manufacturing capacities built so far.

OIL PIPELINES

Pipelines could transform the role of the Gulf as a focus of tanker shipping operations, it has been predicted.

Lloyd's List newspaper analysed in an article the effects that new and upgraded Mideast export pipelines might have on the tanker market as the concentration of the Gulf loading falls.

Gulf tanker terminals expect to dump crude oil into over 1,000 tankers this year, the specialised publication said.

It warned that attacks on ships have become commonplace and besides the loss of life and injuries among seamen, they have caused over $1.88 billion worth of damage to shipping industry.

The paper reviewed the efforts made by Saudi Arabia and Iraq to extend pipelines to export their crude supplies.

It noted that Kuwait similarly has a plan for 540,000 barrels per day pipeline through Saudi Arabia which "is at best only a possibility at this stage".

Lloyd's List argued that the effect of all the proposed pipelines on the tanker market would be serious. Even if not all the proposed pipelines are realised, there was likely to be a deep cut in demand for large tankers.

(Contd. from p. 54)

However production from the installed capacity of 84.44 lakh tonnes of nitrogen and 25.90 lakh tonnes of phosphates after impiementing new or expansion schemes would still fall short of the expected demand. Imports of nitrogenous and phosphatic fertilisers would, therefore, continue to be necessary to meet the demand in full and to ensure adequate availability.

At present the gap between indigenous production and demand for fertilisers is met through imports. During 1986-87, 22.82 lakh tonnes of fertiliser nutrients were imported as compared to 33.99 lakh tonnes in 1985-86.

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Aluminium surplus this year

The country will have a surplus of aluminium during the current financial year, according to the annual report of the Department of Mines placed in Parliament.

During the last financial year which has just ended, with the production of aluminium by National Aluminium Company (NALCO) the domestic production of the metal will be around 4,00,000 tonnes against the demand of 3,90,000 tonnes.

However, present projections by the Ministry show that there will be a change from surplus to deficit of the metal in 1994-'95 unless additional capacity is created by the terminal years of the Eighth Plan period. Meanwhile, with a view to absorbing the temporary surplus, the Department of Mines has adopted a policy to encourage replacement of copper, lead, zinc and wood by aluminium.

According to the report, phase I of the alumina refinery as well as smelter at NALCO was completed during the last year. Three units of captive power plant were also commissioned. Phase II of the alumina refinery is also mechanically complete and is now ready for start-up.

The report says that Bharat Aluminium Company achieved 92 per cent capacity utilisation during 1987-88. This achievement was despite the fact that there were frequent interruptions in power supply by the Madhya Pradesh Electricity Board and two natural calamities that struck the Korba aluminium complex during the year.

As regards copper, the report says that Hindustan Copper sold 50,000 tonnes during the year against 50,644 tonnes in 1986-87. Total import of copper during the last year is estimated at 80,000 tonnes to meet the total demand in the country estimated at 1,30,000 tonnes.

Hindustan Zinc fell short of its targets in producing lead and zinc during 1987-88. Against a production target of 63,000 tonnes of zinc and 23,000 tonnes of lead, the production of the two metals was 48,000 tonnes and 20,400 tonnes respectively.

Regarding the Gandhamardan bauxite project, the Department of Environment had given the clearance in October last subject to the condition that no work on the project would be started till the revised environmental management plan is approved by the Environmental Management Authority of the Government for the project.

APSSIDC PLANS 3 PLASTIC PROCESSING ZONES

The Andhra Pradesh Small Scale Industries Development Corporation (APSSIDC) has drawn up plans to establish three plastic processing zones at Hyderabad, Vizag and Vijayawada, of which the first would come up in the capital city involving an investment of Rs. 7.5 crores.

Addressing newsmen in Hyderabad recently, Mr. J. Harinarayan, Managing Director of the corporation, stated that the Hyderabad zone will have 30 units and entrepreneur selection will be over by next month-end.

The Andhra Pradesh Industrial and Technical Consultancy Corporation has been entrusted with the job of preparing project profiles.

Mr. Harinarayan stated that in view of the projected growth of petrochemicals in the State, plastics are bound to come to the fore in SSI sector and the plastic zones are mooted on lines of Gujarat State providing stabilised power supply and other infrastructural facilities. Each zone will have its own raw material depot.

MODVAT SCHEME EXTENDED

The Government has extended by one year the scheme of higher Modvat credit which was to expire on April 1, 1988.

However, the extent of higher credit available under the scheme has been reduced from 10 per cent ad valorem to five per cent ad valorem.

A notification issued by the Finance Ministry on April 1, 1988 has amended the notification no. 175 of 1986 to this effect.

Through another notification, the Finance Ministry has also rescinded excise notification.

MAXIMISING INDUSTRIAL PRODUCTION:

New scheme announced

The Union government announced a new scheme to achieve maximum industrial production effective from April 1, 1988.

As per this scheme, the industrial licences/registrations with technical authorities will automatically be re-endorsed with the maximum production actually achieved by the industrial undertakings in any of the financial years between April 1, 1988 and March 31, 1990.

There will be no restrictions on such re-endorsement of capacities except that the undertaking should have a valid industrial licence/registration for the item concerned and that the item should not be reserved for the small-scale sector nor should it form part of the schedules IV and V of the exemption notification of February 16, 1973, issued under the provisions of the I (D/R) Act as amended from time to time.

According to a press note issued by the department of industrial development, ministry of industry, the objective of the scheme is to maximise industrial production from the existing installed capacity of plant machinery and equipment so that the assets already installed could be put to the utmost use.

It is not the purpose of the scheme to create additional capacity by making new investments in the projects already in operation.

There may, however, be cases where marginal additional investments may become necessary by way of balancing equipment and de-bottlenecking in order to get the maximum production out of the existing plant, machinery and equipments. To take care of this possibility, additional investment, if any in plant, machinery and equipment should not exceed 10 per cent of the existing book value of investment in plant, machinery and equipment related to that particular item of manufacture.

The scheme will apply to all industrial undertaking including MRTP/Fera companies as also to all items regardless of whether or not they are covered by the first schedule of the I (D/R) Act. Locational restrictions will also not apply to this scheme. In case of MRTP/Fera companies, the scheme will be available to both appendix-I as well as non-appendix-I items.

If the industrial undertaking carries an export obligation in respect of the item concerned, whether in industrial licence/registration or in approvals for foreign collaboration and import of capital goods, the export obligation will equally apply to the enhanced production achieved by the undertaking under this scheme.

In the event of non-fulfilment of export obligation, re-endorsement of capacity in accordance with this scheme will not be permitted.

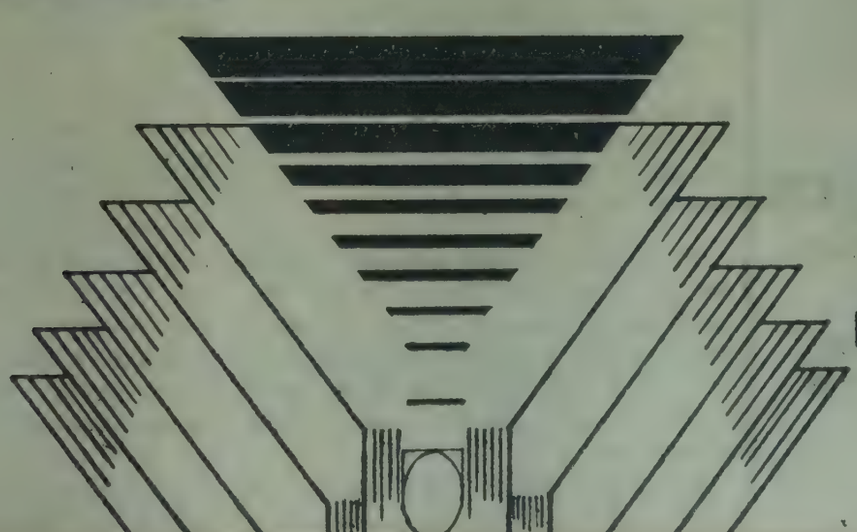
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NEW GAS-BASED PROJECTS:

ONGC for equity participation

The Oil and Natural Gas Commission (ONGC) is willing to participate in the equity of new natural gas-based projects in areas, such as Tripura, where there are no takers for the gas despite, its abundant availability. Indicating this in Calcutta recently Col. S. P. Wahi, ONGC chairman, said that the commission would also consider supplying the gas at reduced prices for a certain period of time to enable the projects to get off a good start.

Meanwhile, ONGC has decided to change its prospecting strategy in the Bengal basin from exploration of structural traps — which yielded promising results in Gujarat, Assam and the Krishna-Godavari basin but not in the area in question — to selective drilling in stratigraphic tracts.

"Even though the Bengal basin is potentially one of the most interesting areas and ONGC has already invested Rs. 200 crores in exploration, so far there has been no visible success resulting in the change of strategy", Col. Wahi said.

In addition, the commission has identified certain high intensity search areas in West Bengal in consultation with Soviet experts near Contai, Murshidabad and in the south 24 Parganas district as well as off-shore sites. Exploratory drilling of six wells in south 24 Parganas is now being taken up in association with the USSR.

Speaking to newsmen Col. Wahi said that Tripura had emerged as a major onshore gas field in the country and it was in a bid to ensure the optimum use of the available natural gas — and also to obtain adequate returns on its investment on exploration — that ONGC was now willing to support gas-based industrial ventures — be they in the public or joint sectors.

It had already been decided to supply has at a low price of Rs. 500 per 1000 cubic metres in Tripura and other north eastern states compared to a rate of around Rs. 1400 per 1000 cubic metres in other parts of the country. ONGC would also consider price concessions and equity participation in other states were natural gas found no takers at present, he added.

National gas grids

Making a strong case for the establishment of a national gas grid, Col. Wahi said that if this was done then the significant discoveries made in regions such as Tripura, Krishna-Godavari and Rajasthan could be used as a substitute for oil and in diverse sectors such as households, fertilisers, power, sponge iron and transportation, among others.

Referring specifically to Tripura, he said that so far commercial accumulation of gas had been discovered in all the four structures taken up by the ONGC for drilling and added that 46 million cubic metres of gas had been supplied to the Tripura state electricity department (TSED) and the commission had committed to supply one million cubic meres of gas per day by 1993.

As per a priliminary study conducted by ONGC, the total gas consumption potential in Tripura was estimated to be around 4.4 million cubic metres per day. Out of this around 1 24 million cubic metres per day could be used as fuel while the rest could be utilised as feedstock for the fertiliser, methanol and other industries. A trade enquiry had also been floated by the commission for preparation of a feasibility report for supply of gas through pipeline to residential areas in Agartala city.

Stating that ONGC had approached the Centre for a Rs. 300 per tonne hike in the price the crude produced by it, Col. Wahi mentioned that the current rate of Rs. 1,830 per tonne had been fixed in 1981 and there had been no subsequent upward revision despite the prices of petroleum products having gone up periodically. Of the Rs. 1,830 per tonne received by it, ONGC was required to pay back Rs. 792 per tonne to the Centre by way of royalty and cess. In addition ONGC was providing subsidies to the tune of Rs. 120 to 130 crores to various sectors, he said, in justification of ONGC's demand for price revision.

He further disclosed that ONGC funds in excess of Rs. 500 crores were currently locked up with various public and private sector units but was confident that these would be recovered in due time.

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Inputs import for GAIL, ONGC, OIL use duty-free

The facility for issue of duty-free licences for the import of inputs which go into the manufacture of supplies to the Oil and Natural Gas Commission (ONGC), Oil India Ltd. (OIL) and Gas Authority of India Ltd (GAIL) has been restored in the new import-export policy.

The chief controller of imports and exports issued a press note giving the procedure which will be followed in the next few weeks to deal with the cases regarding issues of supplementary licences under the special arrangement prevailing prior to April 1, 1988.

The procedure to be followed is:

In the case of those applicants who have already been issued supplementary licences, but have not made and imports, they may surrender their supplementary licences and obtain a special imprest licence for all such supplies. This would also be equally applicable where the consignments have been kept in bond before clearance. Applicants will be required to submit their applications not later than April 15 to the office of CCI and E (EP II section).

Those exporters who have already applied for supplementary licences but have not yet been issued supplementary licences, may also apply for the issue of special imprest licences. The applications will be required to be submitted to the office of CCI and E (EP II section) also by April 15. In all such cases no supplementary licences will be issued for the same specific orders.

After the receipt of all such applications, a special meeting of the headquarters advance licensing committee is proposed to be convened for the speedy clearance of all such cases.

The licences will be issued by the end of the month in terms of the new import-export policy (1988-91), it is stated.

HALDIA PETROCHEM: PROMOTERS OFFER TO REVISE PROJECT

The West Bengal government has assured the Centre that once the Haldia petrochemicals project is approved in principle by the Union finance ministry and sent back to Industrial Development Bank of India, it would have the viability of the naphtha cracker plant of the proposed capacity of 139,000 tonnes, reappraised by Engineers India Ltd., a Central government undertaking.

In a recent communication to Union finance minister N. D. Tiwari, West Bengal chief minister Jyoti Basu while reiterating that the state government has an "open mind" on the subject of the minimum economically viable size of the naphtha cracker, said that if Engineers India was of the definite opinion that it would be desirable to increase the size of the cracker to 250,000 tonnes, then the promoters would revise the project accordingly and settle the financial package including the debt-equity ratio norms and promoters' contribution with the institutions on the revised basis, before orders are placed for the cracker plant.

Mr. Basu has, however, added that work on all downstream units and infrastructure would start immediately without waiting for a final decision on the naphtha cracker. It is reliably learnt that the Union finance ministry still has some doubts regarding the viability of the project at a cracker size of 139,000 tonnes and feels that the cracker size be increased to 250,000 tonnes as this size is economically preferred and acceptable.

In fact, the chief minister in his letter has mentioned that "it is informally understood that your ministry feels that this (the capacity) should be raised to 250,000 tonnes in order to make it economical."

CRUDE BUYING NORMS IN FOR REVIEW

The Government will review the procedures for procurement of crude in international market in order to reduce foreign exchange outflow from the country.

This was decided in the strategy meeting on petroleum sector presided over by the Finance Minister, Mr. N. D. Tiwari, in New Delhi on April 7. The Minister of State for Petroleum, Mr. Brahm Dutt, and senior officers of the Ministry of Finance and Department of Petroleum were also present at the meeting which also decided to look at ways to make the investments in the oil sector more effective.

It was decided that top priority will be accorded to developing promising oil fields and installation of early productive system to increase oil production. In this connection, intensive and extensive exploration activities have to be taken up, according to an official release.

In the interest of getting quick results from the oil reserves and exploration activities, the meeting decided to streamline procedures intended to reduce time in investment and purchases of machinery.

The Finance minister expressed concern over the increase in consumption of petroleum products, specially motor spirit, in the country.

At present, oil has the largest single impact on India's foreign exchange budget involving about Rs. 4000-4500 crores. He, therefore, recommended the policy of restraining, economising and conserving consumption of motor spirit and other petroleum products, the release said.

HIND ANTIBIOTICS PRODUCTION UP

The Hindustan Antibiotics Ltd. (HAL), a public sector undertaking at Pimpri, near Pune, has achieved a growth rate of 33 per cent during 1987-88.

An HAL release said the company also set new production and sales records. The value of production was Rs. 72 crores compared with Rs. 54 crores last year. Production of penicillin rose from 217 million mega units to 264 million mega units and streptomycin production was 113 tonnes against 89 tonnes in the previous year.

The company also re-started the gentamycin plant and achieved 87 per cent rise in the production of 6-APA — the intermediate required for the production of ampicillin — for which HAL's own enzyme technology was used. Production of formulations was worth Rs. 51 crores compared with Rs. 42 crores in the previous year.

The release said six new drugs were also introduced in the market.

IBRD aid for ONGC project

The World Bank will provide the Oil and Natural Gas Commission (ONGC) with a line of credit for investment in ONGC's Western India gas development project in 1988-89.

Official sources in Calcutta said the bank credit would be to the tune of $ 295 million (about Rs. 383.5 crores), against a total project cost of Rs. 1550 crores.

As it had been worked out, about $ 76 million would be allocated for process facilities, about $ 70 million for drilling services, $ 61 million drilling material equipment and $ 50 million for pipeline system, while an estimated $ 28 million would be spent on seismic survey, engineering and the like.

As things stand now, the scope of the Western India project touches phase two development of South Bassein field, gas sweetening facilities at Hazira phase two, gas component of Heera field phase two, mid and South Tapti field and Gandhar and Dahej fields.

At the moment, ONGC was executing three projects under World Bank assistance, namely Krishna-Godavari, South Bassein and Cambay.

The Krishna-Godavari project loan agreement was signed in 1982 between the Centre and the World Bank for financing a portion of the foreign exchange cost of exploration in the project area involving an estimated $ 165.5 million. Till April 1987, the commission spent an estimated $ 10906 million. During 1987-88, it was expected to utilise another $ 23 million. In a recent communication, the bank had indicated its mind to divert a part of the unutilised funds for offshore drilling if the whole loan amount was not used within the stipulated time.

The loan agreement for financing a part of the foreign exchange cost of the South Bassein offshore gas development project, one of India's largest free gas fields has signed with the World Bank in 1983.

The bank's contribution amounting to $ 139.3 million was intended to finance the offshore pipe laying contract, platform installation and technical services.

The Cambay basin stretching from Ankleshwar in the south to Mehsana in the north Gujarat is one of the best explored basins in the country. The project estimated to cost about Rs. 700 crores has been granted World Bank aid to the extent of $ 242 million. The loan, which became effective in 1984, would close in 1990.

OIL OUTPUT EXPECTED TO BE 2.45 MILLION TONNES

Oil India Ltd. (OIL) is expected to produce 2.45 million tonnes of crude against the revised target of 2.55 million tonnes for 1987-88, the Deputy Minister for Petroleum and Naturel Gas, Mr. Rafique Alam, told the Lok Sabha recently.

He said in a written reply that the main reasons for the inability of OIL to utilise the Plan outlay fully were, non-receipt of some capital equipment, etc. during the year and delay in receipt and commissioning of drilling and work-over rigs and consequent savings in drilling outlay.

Exploratory wells

A total of 347 exploratory wells were drilled by ONGC and OIL during the last three years — 1984-85, 1985-86 and 1986-87 — of which 134 proved to be oil bearing, Mr. Rafique Alam informed the House.

In reply to another question, he said the demand/consumption of petroleum products in the country is estimated to have gone up from 38.79 million tonnes in 1984-85 to 46.21 million tonnes in 1987-88.

The Deputy Minister said the indigenous production of petroleum products is estimated to have increased from 30.24 million tonnes in 1984-85 to 44.19 millon tonnes in 1987-88.

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OILFIELD EQUIPMENT AND SERVICES :

More concessions for domestic bidders

In a major concession to industry, the norms of according price preference and other facilities to domestic bidders of oilfield services against international competitive bidding (ICB) have been revised with immediate effect. The new norms, announced by the Oil and Natural Gas Commission in consultation with the Union Government, are more liberal than the existing ones.

Other concessions offered to the domestic bidders relate to exchange rate risks, duration of the contract, repatriation of the rupee cost and withholding tax. All these issues were being discussed by ONGC, the Petroleum Ministry and the domestic oilfield equipment and services industry.

A circular issued by ONGC stipulates that in all future tender documents for service contracts, the new provisions would invariably be made. The new norms would have only prospective effect and contracts already finalised will not be affected by these. Also, all previous instructions issued in connection with the existing norms will stand superceded.

The new price preference for domestic bidders will now be 40 per cent for bids based on indigenously manufactured and owned equipment, 25 per cent for bids based on indigenously manufactured and leased equipment, 25 per cent for bids based on imported and owned equipment and 10 per cent for bids based on imported leased equipment.

In cases, where more than one indigenous bid faills within the price preference range of 10-40 per cent, the bids would be considered strictly according to the following order of priority:

(a) bids based on indigenously manufactured and owned equipment,

(b) bids based on indigenously manufactured and leased equipment.

(c) bids based on imported and owned equipment and (d) bids based on imported and leased equipment.

For instance, in a case where there are a few indigenous bids falling within the range of price preference, the bids based on indigenously manufactured and owned equipment eligible for 40 per cent price preference would be considered. If there is no such bid, then the bid based on indigenously manufactured and leased equipment eligible for 25 per cent price preference will be considered.

In case there is more than one domestic bid in a particular category of price preference, inter-se ranking of the domestic offers would be arrived at by loading the foreign exchange content of each domestic bid by 25 per cent. This loading of foreign exchange content will, however, not affect the level of the bid or the ranking of foreign bidders vis-a-vis Indian bidders already determined on the basis of price preference without such loading.

In other words, the loading of foreign exchange content will be done exclusively for determining the inter-se ranking of indigenous bids within a particular category of preference.

In case an Indian party goes in for owning the leased equipment through acquisition during the currency of contract, the higher price preference bracket would become applicable from the date of ownership of the equipment as finalised by way of actual transfer of the equipment with necessary Government approvals.

As regards the new norms for other concessions, ONGC will absorb the exchange rate risk only on operating cost. The bidders must be asked at the tendering stage to clearly indicate in their price bids, the details of foreign exchange outgo, which must have the approval of ONGC, while awarding the contract.

The contract period also may now be extended to four-five years with a provision for revised rates after two years on a mutually agreed basis, if the market price fluctuations are found to be within 10 per cent plus or minus. This relaxation is made in the interest of encouraging Indian companies to develop phased indigenisation programme. The facility will be provided only when there is such a need.

In respect of foreign parties, rupee payments made on the basis of accepted rupee components of their bids would not be repatriable by them, according to the new norms. This new condition will be incorporated in all future contracts.

The element of withholding tax will also be excluded for the purpose of comparative evaluation of foreign and Indian bids although it would be payable by the Indian party.

The new norms meet the long-standing demands of the oilfield equipment and services industry for more liberalised norms for price preference, so that they could compete with foreign bidders on equal footing. The oil and gas division of the Confederation of Engineering Industry in particular, has been pressing for these concessions.

According to CEI, the new price preference norms will go a long way in ensuring greater participation of Indian companies in oil exploration activities.

CENTRAL TEAM VISITS PTA PLANT SITE

A three-member Central team headed by Mr. P. V. Krishna, adviser, petrochemicals, visited the state recently arousing a fresh hope of obtaining early clearance for a Rs. 700-crore xylene-PTA plant in Bihar based on Barauni-Oil Refinery.

The team, besides talking to state government officials including the industry secretary, Mr. N. K. Singh, visited the proposed plant site and held discussions with high officials of the refinery.

According to official sources, the team, which is likely to submit its report soon, had "satisfactory" talks with the state government officials.

The xylene-PTA plant envisages an annual production of 1.5 lakh tonnes of PTA, a basic raw material for polyester-based industries. The plant will be ready in three years for production.

As this plant would depend on the supply of naphtha from Barauni, which is linked presently to Gorakhpur and Kanpur fertiliser units, the linkage issue also figured during the talks. It was suggested by the state government that these two units should be linked to Mathura oil refinery in Uttar Pradesh instead of Bihar.

The state had been granted a letter of intent for a caprolactam plant at Barauni. But as no private partner could come forward for the project, the proposal could not make any headway and the letter lost its validity. Now the state government proposes to set up a caprolactam plant based on benzene, a steel by-product, at Bokaro.

ENERGY CONSERVATION :

Quasi judicial status for nodal body sought

Two significant changes are sought to be made in the Draft Energy Conservation Bill, prepared by the Indian Law Institute on a request from the advisory board on energy. The draft will now provide for making the proposed nodal Energy Conservation Organisation (NECO) a quasi judicial body and will also clearly spell out that non-adherance to the law will not constitute a "criminal liability" but will invite "regulatory penalties."

These changes, among others, were recommended at a workshop on the draft bill in New Delhi on April 4. The suggestion made at the workshop, attended by government officials concerned legal experts and industry representatives, would be incorporated in the draft before its submission to the advisory board on energy and ministries concerned for their approval and the ultimate approval by Parliament.

The quasi-judicial status to NECO, to be set up under the legislation, is proposed to be accorded in two ways. First, the Bill will now seek to empower NECO to frame the rules under the Act. Second NECO will have the power to impose "regulatory penalties."

It was felt by a large number of participants in the workshop that certain regulatory penalties were a must to check energy wastage and to make energy-users comply with the provisions of the legislation.

However, it was pointed out that the use of the word "offence" in the present draft might attract criminal liability, therefore, should be dispensed with and it should be clearly spelled out that violence of the law would invite "regulatory penalties."

Another crucial point that came up related to the implementation of the Energy Conservation Law when it comes to being. It was felt that specific industries and energy users should be brought to the purview of the law to begin with to ensure maximum immediate benefits. These areas, should be selected by the implementing authorities keeping in view the energy-intensity and existing scope for energy conservation.

It was also decided that the Bureau of Indian Standards will be entrusted with the task of drawing up energy conservation standards in collaboration with NECO, wherever required, the present draft envisages that NECO would have the responsibility of fixing the standards.

Later, Dr. Chhatrapati Singh, one of the authors of the draft, explained that the Draft Bill confined itself to energy conservation in the commercial sector. He admitted that the scope for energy saving in agriculture and rural sector as well as in the household sector was immense. But the terms of reference for the institute to draft the Bill did not cover those areas because of certain inherent difficulties including Constitutional and political.

He said legislative measures for energy conservation in agricultural and household sectors would involve the states and local bodies. Likewise, certain "incentives" for energy wastage build into the subsidy on power for irrigation, for instance, are a matter of government policy and therefore, the law cannot run contrary to them.

However, the institute will submit to the Advisory Board on Energy a set of legal measures required to check such wastage as transmission losses and theft.

BHEL DEVELOPS WEAR-RESISTANT LINING MATERIAL

A new wear-resistant ceramic lining material, called Ceralin, has been developed by the Electroporcelains Division (EPD) of the Bharat Heavy Electricals Limited, Bangalore.

Ceralin finds application in thermal power plants and industrial sectors like cement, steel, fertilisers, where a superior wear-resistant material is required to prevent the wear caused by abrasion and erosion of the flowing media, according to an official release.

Since the commercialisation of Ceralin, the EPD has supplied about 1000 P.F. bends lined with Ceralin to various thermal power stations in the country. Out of these, about 300 bends have already been commissioned and have been in service for over 5000 to 10,000 hours till now in Gandhinagar (Gujarat Electricity Board), NTPC's Ramagundam, Madhya Pradesh Electricity Board's Satara station and Tata Chemicals in Gujarat.

EPD has orders for about 800 P.F. bends from various electricity boards and captive power plants.

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Plastic woven sack units seek incentives

The Government ought to rescue the plastic woven sack industry, which it had rendered sick by the mandatory jute order by evolving an incentive package to divert the industry to the export market.

The industry can earn as much as Rs. 200 crores worth of foreign exchange by exporting synthetic bags, according to an official of the All-India Plastic Manufacturers Association (AIPMA).

The mandatory order, requiring consuming industries to use inefficient jute bags against their will, has reduced the capacity utilisation of the industry below 50 per cent and a number of units have shut down.

At a press meet in Bombay, the AIPMA complained that rationalisation of import duty on polymers do not keep pace with the soaring international prices. The periodic reductions in duties would ensure that the landed cost of imported polymers are on par with indigenous prices. Indeed, the Kapoor Committee had also recommended this. The industry is dependent on imports for about 60 per cent of its raw material requirements.

Another matter of concern to the industry is the policy adopted by financial institutions not to encourage creation of new units in this industry spokesmen feel that this is a short-sighted policy which will affect the offtake of upcoming petrochemical projects like the Maharashtra Gas Cracker Complex (MGCC) of the IPCL. Instead of encouraging the growth of the plastic industry, the financial institions are in effect stunting their growth, contradicting the objectives for which new polymer projects are being put up, they point out.

Plastic substitutes for wooden and metallic products, which would relieve the pressure on these scarce materials, are yet to catch up because of their unrealistic prices, according to industry spokesmen. The enormous potential of plastic culture, which can save water, promote agriculture and fight drought, has been largely untapped, they point out. A more dangerous trend is that rising plastic prices may force reversion of some items like buckets, water taps, water pipes and tubes to the original raw materials like metal and rubber.

Plastic processors are glad that moulded and extruded plastic products, which are produced in the country, will not now be imported under OGL as per the new Exim policy. However, the important raw materials, ABS moulding powder, needs to be placed under OGL. The industry has also reiterated its plea for allowing imports of barrier resins (ionomer and amorphous nylons) under OGL as these are essential for producing multilayer films and multilayer containers as there is no indigenous manufacturer of these resins in India.

Sanitary articles made of plastics have now been brought under the purview of excise duty at 20 per cent ad valorem. Since these items are largely used for low and medium-cost housing, this should be withdrawn, the industry has recommended. Also, the proposed levies on plastics used in the building industry (water tanks, PVC doors, window frames, etc) will militate against national objectives, like rural water supply and forest conservation, it is claimed. The industry is also unhappy with the increase in excise duty on plastic furniture from 25 per cent to 30 per cent.



MODERN CHEMICALS

M/s. Modern Chemical Corporation (Ahmedabad) (301, R. M. Roy Marg, Bombay-4) has recently been appointed as distributors of M/s. Gujarat Heavy Chemicals Ltd.

Modern Chemical is a growing Agency House, acting as authorised dealers of Grasim Industries Limited and Gujarat Heavy Chemicals Limited. They are dealing in a wide spectrum of industrial chemicals. This company has expanded due to its fervent services to industries and because of its sincerity and integrity towards its customers.

The company caters to industries based in Gujarat and Maharashtra, for items such as Caustic Soda, Liquid Chlorine, Soda Ash, Acetone, Formaldehyde, Glycerine, Stearic Acid and other industrial chemicals.

With the appointment as distributors of Gujarat Heavy Chemicals Ltd., Modern Chemicals envisages broadening the spectrum of its activities.

Measures to check industrial pollution

The World Watch Institute has said that chemical pesticides and the discharge of a large quantity of industrial waste pose a widespread threat to health, the Minister of State for Environment, Mr. Z. R. Ansari, told the Lok Sabha recently.

Important measures taken by the Government to tackle the problem include:

— Standards have been set for discharge of industrial effluents for major polluting industries.

— Consents are required to be taken from the pollution control boards for discharge of effluents and the boards in giving such consents, regulate measures to be taken for pollution control.

— Legal action is taken against the defaulting industries.

— Legal provisions have been incorporated in the Environment (Protection) Act, 1986 for hazardous substances management.

— Legal provisions have been made in the Insecticides Act, 1968, for safety in manufacturing and dealing with pesticides, insecticides and herbicide.

— Hazardous industries are required to prepare and implement disaster management plans and get these approved by the nodal departments of the Government.

— Restrictions on the manufacture of pesticides such as DDT have been imposed.

— Guidelines for siting of industries have been framed.

— Fiscal incentives are provided for adopting pollution control devices including shifting of industrial units from congested areas.

Pollution in Ganga

About 75 per cent of the pollution in the Ganga is from the discharge of untreated domestic wastes from different towns situated along the river.

Replying to Mr. Anand Singh, Mr. Ansari said of the total domestic wastes discharged into the river, 88 per cent was from 27 class-I cities (population of over 100,000).

The extent of pollution was the highest at Kanpur, Allahabad, Varanasi, stretches of Uttar Pradesh, the Patna stretch in Bihar and Calcutta metropolitan district in West Bengal.

Replying to another question, Mr. Ansari said no study about the percentage of increase or decrease in the level of pollution during the last three years has been carried out under the Ganga action plan.

The impact of schemes taken up under the plan would be known only after their completion. Most of the schemes for interception and diversion of waste water under the action plan are expected to be completed by the end of the Seventh Plan.

CST ON MICA HITS INDUSTRY

Imposition of Central sales tax on purchase of mica by "misinterpretation" of section 5(3) of the Central Sales Tax Act has created serious problems for the sagging mica industry.

According to industry sources, this section was introduced by the government of India to provide a "booster dose" to declining export performance but some state governments interpreted it differently turning "what was intended to be an incentive into a disincentive."

The commercial department of Andhra Pradesh, for example, has interpreted the provision under this section to mean that if mica is purchased before the date of export order, though for the purpose of export, it should be assessed to tax.

The Mica Trading Corporation of India Ltd. (Mitco) the canalising agency for mica trade, which has been fighting against it proposes to take up the issue with the higher authorities in the Union law ministry as it feels that it is against the spirit of the section and would adversely affect mica trade and, in turn mica mining industry.

Presumably this is being done by the states to corner as much tax revenue as possible ignoring the vital aspect of sagging export performance of the country. Mica industry has some pecularities. Because of adverse market conditions are inability of the miners to sell mica at lower rates, the sources said, the mining industry has been reduced in size to the present 20 per cent of what it was 20 years back and one per cent of what it was 40 years back. "If this trend goes on for some more period, we are afraid, the situation may further deteriorate and the impact will be catastrophic for the poor workers, labour, small dealers and other people involved in mica trade."



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Bindal Agro acquires IEL's unit

Bindal Agro Chem. Ltd. has acquired an LDPE plant from IEL, Calcutta.

The plant, with a capacity of 15,000 tonnes per annum and based on alcohol, is being shifted from Rishra (near Calcutta) to Noida, New Delhi.

The acquisition of the plant will enable Bindal Agro Chem, an agro-based company belonging to the OSWAL Agro group, to enter the petrochemicals field.

The plant has been purchased for about Rs. 10 crores from IEL and the West Bengal government has approved of its shifting outside the state.

According to Mr. Abhay Oswal, chairman, the LDPE plant would commence commercial production at the new site in early 1989. It would produce about 15,000 tonnes of LDPE valued around Rs. 45 crores during that year.

The company would convert sugar molasses into alcohol which will be converted into ethylene and finally into low density polyethylene. In view of the abundance of sugar molasses in UP, the plant is expected to be highly profitable, Mr. Oswal said.

The capacity of the plant will be expanded in stages to meet the increasing needs of consumers in and around the plant site. The aggregate demand of LDPE in the country is currently placed around 96,000 tonnes and expected to rise to over three lakh tonnes by 1994-95. Large imports of LDPE are being made to fill in the gap between demand and indigenous production.

The overall cost on the LDPE project would be around Rs. 40 crores, which will include dismantling, shifting, installation as well as renovation cost of Rs. 10 crores. The setting up of facilities for the conversion of molasses into industrial alcohol will cost around Rs. 10 crores and the working capital requirements would be around Rs. 8 crores.

To meet the cost of the LDPE project as also diversification and augmenting long-term working capital requirements, the company is issuing fully convertible debentures of Rs. 41 crores on a rights basis in the ratio of 1:1, subject to a minimum of 15 bonds. It has proposed to issue bonds of Rs. 105 each, which will be converted into three equity shares of Rs. 10 each at a premium of Rs. 25 per share after three months from the date of allotment.

The company's operating income has shot up from Rs. 3.68 crores in 1986 to Rs. 55.29 crores in 1987. Its gross profit after interest charges has shot up from Rs. 66.17 lakhs to Rs. 5.63 crores. After providing Rs. 52.28 lakhs (Rs. 5 lakhs) for depreciation and Rs. 80.40 lakhs (nil) for taxation, the net profit amounts to Rs. 4.30 crores against Rs. 62.58 lakhs for 1986.

The transfer books will remain closed from April 29 to May 5, 1988.

30 LICENCES, 15 LIS ISSUED IN MARCH

The letter of intent given to HCL Limited to manufacture 5,000 numbers of electronic teleprinters annually was converted into a licence during January.

In all 30 licences and 15 letters of intent were issued during the month.

Two licences — one issued in 1970 and another in 1972 — to a Ludhiana based company to manufacture oxygen were declared dormant. Seven letters of intent were cancelled while five lapsed.

Industrywise, eight of the licences were for electrical equipment industry, five for metallurgical industries, four for chemicals, three each for telecommunication and industrial machinery and one each for transportation, machine tools, miscellaneous mechanical engineering industry, dyestuffs, drugs and pharmaceuticals, texiles and timber products.

Categorywise ten of the licences were for manufacturing new articles, nine each for carrying a business and for setting up new undertakings, and two for effecting substantial expansion.

Industry-wise three each of the letters of intent were for metallurgical and chemical industries, two each for tele-communication and drugs and pharmaceuticals, and one each for transportation, industrial machinery, textiles, paper and food processing.

Categorywise, nine of the letters were for setting up new undertakings, four for manufacturing new articles and two for effecting expansion.



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Hind. lever export poised to cross Rs. 100 cr.

Hindustan Lever's exports are poised to cross the Rs. 100-crore mark during 1988. The exports during 1987 climbed up by 16.46 per cent to Rs. 92 crores from Rs. 79 crores in 1986. During the five-year-period from 1983 to 1987, its total exports have exceeded Rs. 400 crores. The company has recently received an export award from the Government for its performance during 1984-85.

Talking to newsmen in Bombay on April 4, Dr. A. S. Ganguly, Chairman stated that the company had done exceedingly well on the export front despite slow down in world trade in recent times, which has declined to four per cent in 1987 from 8.5 per cent in the sixties and 6.5 per cent in the seventies.

Dr. Ganguly said that the company's export to hard currency areas such as the OECD countries and the Middle/Far East accounted for more than 70 per cent of the total exports with its widening range of non-traditional products, and strategic marketing, well supported by the buoyancy in European currencies and the Government's export promotion policies.

The Chairman pointed out that the company achieved an export of over Rs. 20 crores in readymade garments during 1987, mainly to Europe and the US. A new garments manufacturing unit of the company started operations in the Madras Export Processing Zone (MEPZ).

Dr. Ganguly said that the company had executed a prestigious order from the Unilever Company in Japan — for the supply of 11 million bottles of 'Timotel' brand shampoo which were shipped within a period of eight months.

The company, he added, saw good growth in the case of hand knotted carpets but it faced severe price competition for its cocoa butter substitute fats viz., sal products on accounts of the lower prices of competing substitutes. The company continued to have a steadily growing business from the licence arrangements for branded cosmetic products such as perfumes and lipsticks.

With a large part of its output in 1987 going to the GCA, he pointed out, its Kandla unit now accounted for a significant part of the hard currency exports from the Kandla Free Trade Zone. The products exported from this unit included readymade garments, processed vegetable oils, cosmetics and toiletries such as 'Timotel' brand shampoo and 'Pepsodent' brand toothpaste.

The Chairman explained that the company had now in operation eight export-dedicated manufacturing units. Pursuant to a letter of intent received last year, its Rs. 1.5 crore unit for the manufacture of leather footwear was coming up at Pondicherry. Technical collaboration for this project had been tied up with a large West German footwear company which owned one of the top three footwear brands of Europe. The collaborator would buy-back the entire production from this unit. In marine prod-

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ucts, significant progress was made in aquaculture, backed by years of R and D effort. The commercialisation of these technologies was expected to yield good export business in future years.

He said that despite the continuing uncertainty in market conditions and international currencies, the company made a detailed long term plan, year-wise and by product group. Resources of manpower and capital were being allocated to meet this long-term export plan made by the company. This plant was based on volume growth, rather than merely growth through inflation in unit value. The company viewed with cautious optimism prospects for exports in the coming years.

As regards the company's outlook for the current year, he said that it would entirely depend upon the behaviour of the monsoon. Apart from the capital investment, the company had been spending on 'brands' with a view to reaping long-term benefits. In 1987, the company spent about Rs. 35 crores on this account.

RS. 127 CRS. PROFIT FOR IPCL

The public sector Indian Petrochemicals Corporation Limited (IPCL) in Baroda has recorded a gross profit of Rs. 127 crores during 1987-88, which is 7.6 per cent higher than the previous year.

According to the provisional operating results announced recently, IPCL achieved a gross sale of Rs. 876 crores during the year as against Rs. 743 crores in 1986-87.

IPCL's contribution to the national exchequer by way of excise, customs duty, sales tax and income tax is provisionally estimated at Rs. 340 crores for the year, an official statement said.

During the year, the benzene, ethylene oxide, linear alkyl benzene, acrylonitrile and acrylic fibre plants worked at more than 100 per cent of their rated capacity, it said.

IPCL also achieved a four per cent saving in specific energy consumption over that of the previous year which worked out to more than 25,000 tonnes of fuel oil equivalent, the statement said.

Recently, the Credit Rating Information Services of India Ltd. (Crisil), a subsidiary of ICICI, had allotted its highest rating of triple 'A' to IPCL bonds, indicating the highest safety of timely payment of interest and principle, the statement added.

RECORD OUTPUT AT GUJARAT REFINERY

Indian Oil Corporation's Gujarat refinery has recorded the highest ever crude processing of 8.44 million tonnes during 1987-88 surpassing the previous best output of 7.83 million tonnes in 1986-87.

A spokesman for the refinery — the largest in India — said the indigenous component of the total crude oil processed during the year was 78 per cent. The share of north Gujarat crude had gone up to 3.04 million tonnes from 2.75 million tonnes in the previous year.

The refinery's fluid catalytic cracker (FCC) unit a secondary processing facility, registered a throughput of 1.163 million ton-

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nes during the year, the spokesman said.

On an average, the refinery loaded 620 wagons a day with various products, adding up to a record 1.27 lakhs tank wagons in the year, the number of tank trucks loaded in the period was more than 1.14 lakhs.

Record levels of production were achieved for products like liquified petroleum gas, motor spirit, superior kerosene and high speed diesel.

Two new products — mineral turpentine oil and low viscosity grade low sulphur heavy stock — were launched during the year.

The refinery also began supply of polypropylene feed to Indian Petrochemicals Corporation Limited and Gujarat Narmada Valley Fertilisers Company in this period.

THIRUMALAI CHEMICALS

Thirumalai Chemicals has fared well during the year ended December 1987 and the dividend has been stepped up to 20 per cent from 10 per cent in 1986.

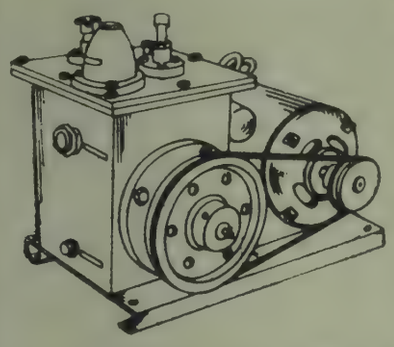
The production of phthalic anhydride during the year was 18,274 tonnes against 14,321 tonnes in 1986, an increase of about 28 per cent. The company recovered 136 tonnes maleic anhydride during the year from the effluent gases.

The income of the company (including other income of Rs. 33 lakhs) during the year amounted to Rs. 32.44 crores on the sales of 16,082 tonnes phthalic anhydride and Rs. 34 lakhs on the sale of 100 tonnes maleic anhydride against Rs. 21.41 crores (including other income of Rs. 21 lakhs), an increase of about 52 per cent over the previous year's.

The company exported 3,184 tonnes against 2,942 tonnes of phthalic anhydride during the year to Taiwan, Singapore and Thailand and earned foreign exchange of Rs. 223 lakhs against Rs. 162 lakhs on f.o.b. basis.

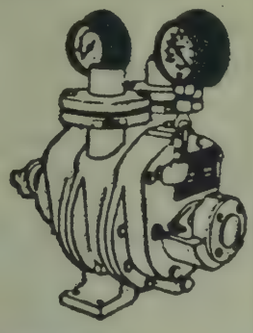
The profit before provision for depreciation was Rs. 532 lakhs against Rs. 234 lakhs. After providing Rs. 400 lakhs against Rs. 241 lakhs for depreciation, Rs. 18 lakhs against nil for taxation and writing off carried forward loss of Rs. 21 lakhs, the net profit after some adjustments, available for appropriation for the year was Rs. 95 lakhs. The proposed dividend will absorb Rs. 39.93 lakhs against Rs. 19.97 lakhs Rs. 54 lakhs against nil has been transferred to investment allowance reserve.

During the first quarter of the current year. The company produced 4,879 tonnes of phthalic anhydride and 116 tonnes maleic anhydride. Despatches during the period were 5,155 tonnes phthalic anhydride (including 2,300 tonnes for exports to China, Hong Kong, Bangladesh and Thailand) and 141 tonnes of maleic anhydride.

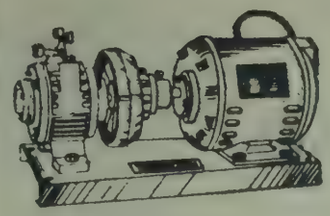


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Successful decade for Rashtriya Chemicals

The Rashtriya Chemicals and Fertilizers Ltd. has completed the first decade of its formation with an overall excellence both in production and financial performance.

The company has achieved the highest ever production at 23 lakh tonnes in 1987-88 as compared to 20 lakh tonnes during the previous year. Sales touched a new high at 20 lakh tonnes as compared to 16 lakh tonnes.

The value of sales is placed at Rs. 853 crores as against Rs. 692 crores last year. The provisional gross profit posted at Rs. 208 crores and after providing for Rs. 105 crores as depreciation and Rs. 51 crores as interest charges, the provisional net pretax profit goes up to Rs. 52 crores as against the net profit of Rs. 20 crores achieved during the last year.

Mr. Duleep Singh, Chairman and Managing Director of the Company has said that the outstanding performance is against the backdrop of the consecutive droughts stalking the country compounded by the turbulent glut situation and shrinking demands.

The Trombay plants produced 10 lakh tonnes of fertilizers including both urea and complex fertilizers. The urea plants achieved 85 per cent capacity utilisation producing 3.64 lakh tonnes. Suphala (15:15:15) registered 100 per cent capacity utilisation from the recently modernised plant, producing 3.34 lakh tonnes as against 2.65 lakh tonnes of last year. The ammonia plants also produced 3.36 lakh tonnes achieving 81 per cent of the rated capacity. The ANP (20:20:20) production at 2.88 lakh tonnes operated at 80 per cent of the rated capacity.

The methanol production at 41,680 tonnes registered a capacity utilisation of 116 per cent as against 36,015 tonnes produced in the previous year. The new nitric acid plant at Trombay achieved an all time high production record of 2.51 lakh tonnes operating at a capacity utilisation of 101 per cent.

Trombay's industrial products contributed handsomely to the overall performance. The production of ammonium bicarbonate, a vital input for the bakery industry, totalled 4,390 tonnes, registering a capacity utilisation of 110 per cent. The output of sodium nitrate/nitrite, the main intermediary for the manufacture of dyestuffs and glass was placed at 3,910 tonnes which showed the capacity utilisation of 98 per cent. Methylamines plant produced 3,095 tonnes, the highest ever achieved, as compared to 2,151 tonnes of the previous best. The product is a vital input for the manufacture of life saving drugs, leather industry, pesticides etc.

The performance of both the ammonia plants of 1,350 tonnes a day capacity and three urea plants of 1,500 tonnes a day each have been excellent. They registered an overall yearly capacity utilisation of 90 per cent. In the later six months the capacity utilisation was 100 per cent. The Thal ammonia plant produced 7.9 lakh tonnes. The production of urea at 13.4 lakh tonnes was the highest ever achieved. Last year it turned out 10.4 lakh tonnes. The highest daily production of 4,685 tonnes was realised on August 19, 1987 against the daily rated capacity of 4,500 tonnes, 13.8 lakh tonnes of urea was despatched during 1987-88 which is an all time high achieved so far.

HARSHVARDHAN CHEMICALS

Harshvardhan Chemicals and Minerals Ltd. has decided to set up a project for manufacturing sulphuric acid, oleum, chlorosulphuric acid and other products at a cost of Rs. 8 crores.

The entire production of sulphuric acid will be utilised to produce oleum as well as single super phosphate (SSP). The company has also planned to set up a detergent plant on a large scale so that ultimately an industrial product like sulphuric acid is converted into consumer product. The project will be established in 16 to 18 months.

This was disclosed by Mr. Ram Singh Rathore, chairman of the company while addressing the annual general meeting.

Referring to the performance during the current year, he said that orders worth Rs. 250 lakhs are on hand. The company produced 15937 tonnes of SSP in the first five months of the current year as against 13,000 tonnes produced during the corresponding period of the previous year, he added.

E. MERCK TO EXPAND

E. Merck (India) has stepped up the equity dividend for 1987 to 16 per cent from 15 per cent paid for the previous year. The dividend is payable on the enlarged capital resulting from the issue of rights shares. The rights shares are entitled to a dividend from July 1, 1987.

The net turnover of the company for the year amounted to Rs. 40.48 crores against Rs. 38.85 crores in 1986, but the gross profit has been lower at Rs. 251.14 lakhs against Rs. 288.36 lakhs.

After providing Rs. 83.12 lakhs (Rs. 57.62 lakhs) for depreciation, Rs. 35.75 lakhs (Rs. 63.50 lakhs) for taxation and after some adjustments, the profit available for appropriation is higher at Rs. 193.84 lakhs against Rs. 167.24 lakhs. The proposed dividend will claim Rs. 82.72 lakhs (Rs. 66 lakhs) and a sum of Rs. 50 lakhs (same) has been transferred to general reserve.

The long-awaited drug policy was made effective from August, 1987. How far it will contribute towards the company's functioning in 1988 remains to be seen. With new products added to its range of pharmaceuticals as well as chemicals and the consequent anticipated increase in turnover, the profitability of the company should show an improvement.

On account of the reduction in the non-resident holdings from 51 to 40 per cent, the company has acquired a substantial holding in Suneeta Laboratories Ltd., Indore. The company has also acquired a bulk drug unit in Indore for the manufacture of chloroquine phosphate and its derivatives.

As part of a major expansion, a Rs. 10 crores modern pharmaceutical plant in accordance with Merck International standards is under planning at the company's location in Goa, which will cater to the growing demand for the company's products. The chemical division of the company contributed Rs. 6 crores of turnover during the year which will go up to Rs. 10 crores in the current year. The company expects to fare better this year and achieve a turnover of Rs. 52 crores, with more output of import substitution products.

Consequent to indigenisation, the company has received several licences for the production and marketing of essential pharmaceutical raw materials and formulations. The company has started giving effect to these licences by the introduction of these products. In the chemicals division, the product range is being enlarged with the objective of achieving import substitution.

MAFATLAL DYES & CHEMICALS LIMITED FARES WELL

In spite of the continued recession in the textile industry, stringent monetary conditions and drought and floods in certain parts of the country, Mafatlal Dyes & Chemicals Limited has fared better in 1987 compared to 1986.

Although the turnover has increased marginally to Rs. 42.65 crores compared to Rs. 41.65 crores recorded in 1986, the profit before tax in 1987 has increased substantially to Rs. 200.62 lakhs from Rs. 164.47 lakhs for the previous year, a rise of about 22%.

The Directors of the Company have proposed to maintain the dividend of 17%.

The net profit amounts to Rs. 110.62 lakhs (Rs. 95.07 lakhs) after providing Rs. 17.36 lakhs (Rs. 10.23 lakhs) for depreciation and Rs. 90 lakhs (Rs. 69.40 lakhs) for taxation. The proposed dividend will claim Rs. 42.84 lakhs (Rs. 42.84 lakhs). A sum of Rs. 60 lakhs has been transferred to general reserve (Rs. 100 lakhs) and the balance amount of Rs. 93.10 lakhs is carried forward.

SHALIMAR PAINTS

Shalimar Paints fared well during 1987. Gross sales at Rs. 59.54 crores, are up by 14 per cent over 1986 gross sales of Rs. 52.28 crores. The company has thus doubled its turnover since 1983 when it was Rs. 32 crores.

Profit after interest and depreciation works out to Rs. 2.19 crores (2.01 crores). The after tax profit increased from Rs. 1.01 crores to Rs. 1.19 crores.

In the light of such better working results, the directors have stepped up the dividend to 20 per cent from 17-1/2 per cent. The company, which skipped dividend for 1983, declared 10 per cent for 1984 and 15 per cent for 1985. Earnings per share have risen four-fold, from Rs. 1.40 in 1984 to Rs. 6.30 in 1987.

Reserves and surplus at the end of 1987 stood at Rs. 3.7 crores (no revaluation of assets) against Rs. 2.9 crores in 1986.

PVD PLAST

PVD Plast Mould Industries has announced an interim dividend of 10 per cent for the year ended March 1988. This will absorb Rs. 12.50 lakhs. Last time, the total dividend was 15 per cent on a pro-rata basis for a period of 15 months.

The turnover is up to Rs. 10.20 crores from Rs. 8.64 crores for the 15-month period. The gross profit has jumped to Rs. 65 lakhs from Rs. 35 lakhs for the previous period.

The record date is May 11, for the payment of interim dividend.

SPOTLIGHT ON

Biotechnology & Life Sciences (Part 2)

NEW DEVELOPMENTS IN SEPARATION ARE KEY TO BIOTECH SIDE-UPS

Advances in such technologies as chromatography and extraction are enabling these separations techniques to be used for new biotechnology applications. Chromatography is being performed on a much larger scale than was previously done in the laboratory, and several new twists are enabling one extraction operation to replace multiple separation and purification steps. In addition advances in membrane filtration are focussed on the tailoring of membranes for greater specificity and improved resistance to cleaning agents and on the engineering of complete membrane systems for biotech applications.

No wonder that manufacturers in USA, Japan and W. Europe are rushing to develop these technologies. Market research firm Frost & Sullivan Inc., (New York) predicts that sales of separation and purification equipment for biotech applications are expected to increase to the order of 21% per year and from $161 million in 1985 to $415 million in 1990.

Many observers believe that the fastest growing area in the field of bioseparation is mebrane filtration. Frost & Sullivan predicts a tripling of sales of biotech filtration equipment between 1985 and 1990. According to Ed Bjurstrom, senior project engineer at Amgen (Newbury Park, California), there have been over the past few years, constant improvement in the quality -- i.e. strength and uniformity -- of membranes, although the developments have been very individualized and application specific.

One key advance reported by Millipore Corp's Millipore Systems Div. (Bedford, Mass.) is that the membranes are being made more resistant to harsh treatments for cleaning. For example, Millipore recently introduced a new chlorine-resistant membrane and another one that can withstand high pH.

Another stride forward reported by Pall Corporation is the surface activation of membranes for the separation of genetically-engineered proteins. The company would not reveal how this is done, other than to say that copolymers are sometimes used. The advantages of surface-activated membranes are increased specificity and resolution, better yields and improved economies. The company claims that the new technique can achieve flowrates two to three times higher than those of HPLC and because the pressures are much lower (about 5 psi versus 200 psi or more for HPLC), capital and operating costs are 40-50% lower. The systems are not yet being used for commercial production of proteins but units are undergoing laboratory tests and future commercial prototypes are on the development horizon. (*Chem. Eng.*, 1/19/88, pp. 21-25).

GENETIC COMPOSITION OF FAT ABSORBING PANCREATIC HORMONE ELUCIDATED

Researchers at Kissei Pharmaceuticals (Japan) in association with Prof. H. Okamoto of Tohoku University have succeeded in elucidating the genetic structure of both rat and man's pancreatic polypeptide (PP) hormone. This hormone is considered to play a role in adjustment of appetite and absorption of fat. The company's researchers are now endeavouring to search for a substance stimulating synthesis of PP in a bid to develop an agent effective for combating obesity.

PP is a hormone produced in the pancreas. It serves to check appetite and reduce excessive weight by acting on the pituitary gland involved in adjustment of functions of the small intestines and appetite. This effect has been proved through tests on rats.

The genetic structure of PP, as far as man is concerned, was elucidated two years ago, but not in the case of rat. The company reports it has determined the base arrangement of the rat PP gene by means of r-DNA technique -- by inserting the rat -- DNAs in question obtained from its pancreas into those of *E. coli* and by increasing them for determination. This study has proved that rat PP is comprised of 36 amino sequence as does human PP but eight of these amino acids differ from that of man's. The breakthrough can lead to the development of an anti-obesity agent; the company reports. (*Japan Chem. Wk.*, 12/17/87, p. 4).

A STUDY REVIEWS WORLDWIDE AGRO-BIOTECHNOLOGY OPPORTUNITIES

Of over 450 companies working on plant diagnostic tests, genetically manipulated seeds, single cell protein and algae-based products, some 280 are located in the USA, 48

in the UK, 27 in Canada and 16 in Japan. The study captioned 'The Impact of Biotechnology on Plant Agriculture' examines market opportunities in the grain, fruit, vegetable, sugar, oilseeds and animal feed industries in the USA and worldwide.

This study should be of particular interest to an agricultural country like India, but India's name is not even mentioned in this study, showing that our agricultural research has yet to make its mark in agro-biotechnology.

The study is available (price $2950) from Technology Management Group, 25, Science Park, New Haven, CTO6511, USA).

'MAN-MADE AIDS' ALLEGES ANIMAL CARE GROUP OF BRITAIN

The National Anti-Vivisection Society (NAVS) of Britain has made a strong allegation in a recent report that the AIDS virus emerged as a result of a series of experiments on animals beginning in a gibbon colony in Bangkok in 1965.

The Report alleges that an 'international cover up' began in 1980 when research laboratories realized there was a connection between their experiments and the appearance of AIDS in humans. These laboratories were later to claim to have been the first to identify the virus.

The NAVS team claims that after extensive research it has found that 'the production of a deadly and uncontrollable disease like AIDS was inevitable, given the nature of experiments carried out during the 1960s and 1990s. The Report entitled Biohazard states 'the research has revealed that not only was HIV made by a combination of two different viruses, but the only plausible way for this to have happened is in a laboratory'.

The thesis of the Report is that experimentation involving introduction of viruses to new species causes mutation or recombination of the viruses. Modern laboratories are accused of continuing this process -- 'we must now face the fact that the world has possibly hundreds of reservoirs of AIDS-like disease in its laboratories'. (*Lab Practice,* 10/1987, p. 5).

WORLD CONGRESS ON PROTEINS IN 1988

A World Congress on the Utilisation of Vegetable Proteins in Human Foods & Animal Feedstuffs will be held from October 2-7, 1988, in Singapore.

Lais Siedermann of the American Soybean Association is general chairman of the international meeting focussing on vegetable proteins. Co-chairman is Ken Beery of Central Soya Co. Inc. The meeting is being organised by the American Oil Chemists' Society.

The Congress has been scheduled for the week following the ISF-JOCS meeting in Tokyo. For more information contact Joan Dixon, AOCS Meetings Manager, AOCS P.O. Box 5037, Station A, Champaign, IL 61820, USA.

FLUORESCENT GLOW USED TO TRACE TRANSFER OF GENES TO PLANTS & MICROORGANISM AND FOLLOW THEIR PROGRESS OUTSIDE THE LABORATORY

A novel bacterium created in the laboratory may become the all-purpose vehicle to transfer new genes to plants and microorganisms and follow their progress outside the laboratory.

Last October, scientists from Monsanto have tested their modification of the common bacterium *Pseudomonas aureofaciens,* a strain of *P. fluorescens* that colonises to roots of plants. The site for the field test selected was the wheat field in South Carolina, where scientists at Clemson University are collaborating with Monsanto. Scientists at EPA have welcomed Monsanto's experiment at a way of tagging genetically engineered organisms.

Monsanto adapted *P. aureofaciens* by complementing its DNA with two genes from another microorganism, *E. coli,* which is common in nature and found in the human gut. One gene enables *P. aureofaciens* to live on lactose and thus distinguish it from wild relatives. The other gene makes the altered produce a fluorescent blue pigment when mixed with a chromatic substrate called X-Gel.

Monsanto hopes that its *P. aureofaciens* now easily distinguished from the wild type, will become the preferred vehicle for carrying useful genes, such as the gene from *Bacillus tharingiensis* that produces a toxic to kill insect pests.

A microorganism that repels pests, eats sugar and glows blue under fluorescent light would be easy to trace as well as being a valuable pesticide. After dosing winter wheat with the new organisms. Monsanto and Clemson will plant soybeans and then more wheat to check the persistence of the new organism. (*New Sci.,* 10/29/87, p. 28).

JAPAN INVESTS HEAVILY IN A PROTEIN BANK PROJECT

Thirty five Japanese petrochemical companies and MITI have established a non-profit high technology organization known as the Interna-

tional Chemical Industry Promotion Organization (ICIPO) to promote the exchange of international high-tech information and protein banking services.

The MITI and private Japanese companies are putting up some $13.5 million each. With this funding the centre will accommodate a broad spectrum of projects, including pharmaceuticals, specialty chemicals, agrochemicals, pulp and paper and biotechnology, in addition to petrochemicals.

The banking programme is designed to form deposits of high-qality proteins that are looked upon as indispensable in chemical R & D. These proteins are expected to help develop not just enzymes and drugs, but other advanced products including biodegradable plastics, parts of electronic components and sensors.

The proteins will be lent to ICIPO member companies in order to enable them to cut down on R & D costs, and MITI will urge both Japanese and foreign concerns to expand the new organization as far beyond the original 35 member firms as possible. (*Mfg. Chemist.*, 9/1987, p. 9).

HUNGARIAN RESEARCHERS DEVELOP DNA SUPER CHAIN

The world's largest artificial DNA chain is said to have been generated at the Hungarian Academy of Science, Genetic Research Institute at Szeged Hungary. Hungarian scientists have reportedly developed a chemical cum enzyme method which makes it possible to put together a chain of 1,800 units. The Institute reports that transplanted into a bacterium or other living bodies, the new DNA can generate protein which in turn can be used in human therapy. With previous artificial gene-synthesizing methods only short DNA chain's could be generated and the attachment of the parts needed a lengthy purifying process. The new method is claimed to reduce the time of the chemical synthesis by half. (*Mfg. Chemist,* 9/1987, p. 9).

DU PONT PLANT FOR DEVELOPING SUPERIOR EDIBLE OILS VIA BIOTECHNOLOGY

The application of biotechnology to crop plants to develop edible oils -- those used in cooking and processing foods -- with improved fatty-acid composition and superior processing and formulation characteristics is the aim of a broad agreement between Du Pont and DNA Plant Technology (Cinnamon, N.J.). Initial emphasis will focus on development of superior varieties of rapeseed, an emerging major source of edible oil. The companies plan eventually to form a marketing joint venture. (*Chem. Wk.* 12/16/87, p. 20).

A SPEEDY GENE-AMPLIFIER FOR BIOTECH LABORATORIES

The joint venture of instrument maker Perkin Elmer and biotech company Cetus has launched its first product for biotech laboratories: an automated gene amplification system for performing rapid gene multiplication. The system, called DNA Thermal Cycler, is based on Polymerase Chain Reaction (PCR) technology, which consists of a series of repetitive replication cycles. It relies on the use of an enzyme, DNA polymerase, to make as many as a million copies of a target gene sequence. The instrument, with its ability to amplify specific gene sequences, is an important tool in DNA cloning and in the expression of new proteins.

The DNA Thermal Cycler, which is priced at $8500, is a microprocessor-controlled temperature --cycling instrument designed to perform rapid temperature changes and incubations necessary for PCR gene amplifications. It must be used with a $395 Gene Amp research reagent kit that includes the organism *Thermus aquaticus* (Taq), which supplies a heat stable DNA polymerase. With the kit and the cycler, reports Cetus, 'a target DNA sequence can be amplified in first hours rather than the days or weeks typically required by conventional methods'. (*Chem. Wk.*, 12/16/87, p. 70).

CANADA ENCOURAGES BIOTECH R&D IN HER NEW PATENT LAW

The new pharmaceutical patent protection in the new patent law of Canada gives product patent protection to foods and pharmaceuticals (the previous law applied only to processes). Further, to provide Canada's fledging biotechnology industry with some muscle against its powerful neighbour USA, there is a four-year exemption for 'Naturally occuring substances produced by microbiological processes'.

This patent protection is expected to give a big boost to biotech and pharmaceutical R & D. For example, in their efforts to convince the Canadian Parliament to pass the new patent law, multinational pharmaceutical companies agreed to spend $1.4 billion over the next 10 years on research and development in Canada.

In addition there have been nearly $800 million in new projects announced since the Government stated its intention to amend the patent law. The impact of the $1.4 billion in incremental R & D expenditures will create up to 3,000 new jobs by 1995, above and beyond those that would otherwise exist in the industry. (*Chem. Eng.*, 1/8/88, pp 31-33).

A RECENT STUDY ON COMMERCIALIZING BIOTECH PROCESSES HIGHLIGHTS RISKS & HIGH FINANCE REQUIREMENT

The commercialization of biotech processes developed in the laboratories, is a major challenge to the US biotech industry, -- a world leader in this hightech field as per a study by Edward E Bjurstrom of Amgen Inc. and Bonnie J Smelser of Fluor Daniel Inc. of Irvine California. In the competitive environment in the USA, bringing a biotech product to market requires a well-structured plan, to use resources efficiently and minimize the time required. In this detailed study published in Chemical Engineering of Jan 18th 1988, the authors outline the key elements involved in each phase of a bioproduct development programme, from the point where the product concept has been evaluated and approved, to the start up of the commercial facility.

The length of time required for a new product to go to full commercial production often determines the project's success or failure. This is especally true for recombinant-DNA based products or biotechnology intermediates. Thus, planning must incorporate a realistic evaluation of all the logistics associated with each stage of the development. All potential new products should be screened at the conceptual stage as to patent position and competing technologies before being approved for development. This can become very difficult, as there will always be more products with good potential than there are resources to pursue them.

Once a new product has been targeted for development; the programme will consist of three major phases: (1) **Phase I:** Fundamental research and process development; (2) **Phase II:** Process demonstration and planning for market entry; (3) **Phase III:** Commercial production. Each of these phases incorporates a number of simultaneous and sequencial activities geared to defining the project's technical and economic feasibility in increasing detail.

The first two phases also include such pre-requisites as data gathering, securing of financing and identification of and compliance with regulatory requirements. In addition as the project moves through the three phases, the associated financial risk increases as well. For basic research and development a company's risk will be about $100,000 to $2 million (over Rs. 2 crore) or more. For pilot plant construction and operation, about $1-10 million and for commercial plant construction about $10-20 million. Therefore commercialization of a biotech product involves high finance, high risk and detail planning from beginning to end. (*Chem. Eng.,* 1/18/88, pp 81-84).

GENETICALLY ENGINEERED TOBACCO RESISTS PESTS

British scientists by transferring a gene from cowpea plants have engineered tobacco that can escape damage from tobacco budworm infestation. The cowpea gene responsible encodes for an inhibitor of trypsin, an enzyme found in the gut of insect, according to British researchers of the University of Durham's botany department and investigators of the Plant Breeding Institute in Cambridge. The trypsin inhibitor presumably is a part of the cowpea's natural defense system against pests. In laboratory tests, expression of the gene in tobacco plants gave them enhanced resistance to tobacco budworm attack. The scientists note that the same gene could be incorporated into other important crops such as cotton or rice. (*Nature,* **330,** 160 (1987)).

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WESTVACO -- HAVE SIX INTEGRATED PULP AND PAPER MILLS, THREE RESEARCH CENTRES, FIFTEEN CORRUGATED BOX PLANTS, TWO FOLDING CARTON PLANTS, TWO MULTIWALL BAG PLANTS, SIX CHEMICAL PRODUCT PLANTS, OVER 3 MILLION ACRES OF TIMBERLANDS IN 9 STATES

WESTVACO -- SCIENTISTS ACCOUNT FOR AN AVERAGE MORE THAN 30 NEW PATENTS A YEAR AND CURRENTLY HAVE ABOUT 500 EFFECTIVE US PATENTS AND NUMEROUS FOREIGN PATENTS, MANY OF PATENTS ARE LICENSED THROUGHOUT THE WORLD

WESTVACO -- PRODUCED PRODUCTS ARE USED IN --
OLEO CHEMICALS, ADHESIVES: ALKYD RESINS, ASPHALT EMULSIFIERS, CHAIN BELT LUBRICANTS, CORROSION INHIBITORS, DISH WASHING LIQUIDS, EMULSION POLYMERIZATION, EPOXY RESINS, HOUSEHOLD DETERGENTS, LATEX EMULSIONS, LEATHER OILS, METANIC SOAPS, METAL WORKING OILS, ORE FLOTATIONS, PAPER SIZE, PRINTING INKS, SHAMPOOS, SOAPS AND DETERGENTS, SULFATED AND SULFONATED OILS, VINYL PLASTICIZERS, POLY CHEMICALS, AGROCHEMICALS, ASPHALT, CEMENT, DYES AND TEXTILES, PAPER CHEMICALS, WATER TREATMENT RESINS, SOAPS, DETERGENTS, SPECIALITY CHEMICALS, ANIONIC FLOTATIONS, PHOSPHORIC ACID AND FERTILIZER DEFOAMING.

WESTVACO HAVE WORLD'S BEST TECHNOLOGY. MANUFACTURERS/CONSUMERS WITH ADEQUATE FINANCE, ALL INDIA INFRASTRUCTURE AND INTERESTED TO FURTHER PROCESS SOME OF OUR PRODUCTS, PLEASE NAME ITEMS GIVING BIODATA AND COMPANY PROFILE TO

Mahesh (India)

808, Cotton Exc. Bldg., Kalbadevi Road, Bombay 400 002.

Phones: 318756/311190/255817 **Telex: 11-4418 MHSH IN**

ATTENTION: -- MANUFACTURERS -- IMPORTERS AND EXPORTERS --

WE ARE ESTABLISHED IN 1965; ARE VERY WELL PLACED AMONGST THE MOST REPUTED AND MULTINATIONALS IN CHEMICAL FIELDS IN THE WORLD.

OUR TECHNOLOGY SECTION IS ENGAGED IN --

-- SUPPLYING COMPONENTS OF RAW MATERIALS WITH MIXING FORMULAS;

-- SUPPLYING COMPLETE SERIES OF TEXTILE PROCESSING CHEMICALS;

-- SUPPLYING RAW MATERIALS WITH END-USE TECHNOLOGY;

-- SUPPLYING TECHNICAL ASSISTANCE TO PRODUCE RAW MATERIALS AS PER INTERNATIONAL STANDARDS;

-- SUPPLYING TECHNOOGY IN DYES AND CHEMICALS WITH BUY-BACK ASSURANCE/ MARKETING ASSISTANCE.

OUR INDENTING SECTION IS ENGAGED IN --

-- INTERMEDIATES FOR DYESTUFFS AND PHARMACEUTICALS;

-- RAW MATERIALS LIKE POLYVINYL ALCOHOL FROM DENKA-JAPAN; EMULSIFIABLE POLYETHYLENE WAX (HI-WAX) AND OTHER INDUSTRIAL WAXES FROM MITSUI PETROCHEMICALS, JAPAN; MICROCRYSTALLINE AND OTHER WAXES FROM JAPAN AND EUROPE; DYCYANDIAMINE, PHENOL, RESINS FOR INK ETC.

-- SPECIALITY CHEMICALS LIKE ROSIN, EMULSIFIERS, CERAMICS & REFRACTORIES, CLAYS, HERBICIDES & PESTICIDES, PHENOLIC RESINS, ASPHALT EMULSIFIERS, INDUSTRIAL WATER TREATMENTS, AGRICULTURAL MICRONUTRIENTS, CONTROLLED RELEASE CARRIERS -- FOR PESTICIDES, PROTEIN COAGULANTS IN PURIFICATION OF FATS AND OILS, COMPONENTS IN NEGATIVE PLATE EXPANDERS FOR STORAGE BATTERIES, OXYGEN SCAVENGERS, ADDITIVES FOR INDUSTRIAL CLEANERS.

WE HAVE WORLD MONOPOLY IN SOME OF THE ITEMS LIKE SODIUM LIGNO SULPHONATES, OIL DRILLING CHEMICALS, DIACID (C-21 IN LIQUIDS) AND SOME TEXTILE PROCESSING CHEMICALS.

Mahesh (India)

808, Cotton Exc. Bldg., Kalbadevi Road, Bombay 400 002.

Phones: 318756/311190/255817 **Telex: 11-4418 MHSH IN**

NEWLY DEVELOPED TEXTILE PROCESSING CHEMICALS FROM JAPAN

* We are one of the pioneer indentors of textile chemicals. A wide range of textile chemicals, some of which are latest developments in the world are available from our principals in Japan.

SOME OF THE ITEMS CAN ALSO BE MADE AVAILABLE IN CONCENTRATED FORM WITH MANUFACTURING RECIPE. TECHNICAL EXPERTS FROM OUR PRINCIPALS ALSO IMPART ADVICE ON ANY TECHNICAL PROBLEMS YOU HAVE ON PROCESSING PROCEDURE.

We regularly indent:

-- **Softeners** (Cationic softener, Amino modified Silicone type softeners, softener in dyeing baths etc.)

-- **Textile printing chemicals** such as Forming Binder, Transparent printing Binding, binder for glitter powder, Pearl Binder, Adhesive for metallic foil printing, Raising agent for T/C and polyester, anti raising agent for T/C. Resist printing agent for reactive prints, White and pigment coloured resist printing thickeners for reactive dyestuff, special coating material for waterproof of synthetic fibre, white and colour dicharge printing agent, Discharge printing agent, cripple printing agent, assistant for pigment printing on dyed fabrics, colour value improving agent for disperse dyes. Weight reducing agent for polyester fibre, antistatic agent for polyester fibre etc.

-- **Whitening agent** for polyester fibre

-- **Anti-flaming agent** for all fabrics

-- **Spin-finish oil** for man-made fibre etc.

AND SPECIALITY CHEMICALS

Please Contact:

Mahesh (India)

808, Cotton Exc. Bldg., Kalbadevi Road, Bombay 400 002

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SPECIAL FEATURE

Extracts from the Import and Export Policy - 1988

The Import Policy was presented to Parliament on 31st March 1988. The policy will remain in force for a period of three years from 1st April, 1988 to 31st March, 1991.

In the forthcoming pages we are presenting the various annexures pertaining to chemicals, drugs and allied industries.

The analysis has been classified into two heads i.e. (A) Import of Raw Materials, Components and Consumables, (B) Import of Capital Goods.

A. Import of Raw Materials, Component, and Consumables.

These have been classified into the categories of:

(i) Banned
(ii) Restricted
(iii) Limited Permissible
(iv) Canalised
(v) Special Imports under OGL
(vi) Open General Licence.

(i) Banned Items

Tallow, Fat and/or oils
Lard Stearine,
Oleo Stearine,
Lard Oil,
Oleo Oil
Tallow Oil

(ii) Restricted Items

6-APA
ABS Resin/Granules/Moulding Power (all grades)
Acetanilide
Acetate Filament Yarn excluding first quality
Acetozolamide
Acetyl Salicylic acid
Allyl Isothiocyanate
Amidopyrine
Amoxacillin (including amoxacillin trihydrate) excluding Amoxacillin sodium
Ampicillin trihydrate and ampicillin anhydrous excluding ampicillin sodium
Analgin
Aniline/Aniline oil and salts thereof
Artificial plants, flowers and components there of
Benzyl acetate
Benzyl chloride
Benzyl benzoate
Benzo-trichloride
Blended fabrics/yarn
Caustic soda
Chloroquin phosphate and diphosphate excluding chloroquin sulphate
Copper oxychloride
Cresylic acid and mixed cresols (both medical and technical grades) and cresol ortho/meta/-para with purity less than 97% including tar acids and cresol oils having a boiling range below 220°C.
Cyano-base and ethio heptazine citrate
Cyclamic acid and its salts
Diazepam
Dimethyl sulphate
Doxycycline base, its hydrate/hyclate/hydrochloride/calcium complex and intermediates thereof
2:4 Dinitrochloro benzene
DNPT (Dinitroso pentamethylene tetramine).
Erythromycin (base), erythromycin estolate and erythromycin stearate, excluding erythromycin ethyl succinate
Ethambutol
Ethanolamines (mono, di and tri)
Flavouring essences -- all types (including those for liquors)
Folic acid
Formic acid
Gelatine (all grades)
Gentamycin sulphate including gentamycin CCA
Glycerophosphoric acids and its salts
Hexachlorophene
Hexamine
Insecticides, Pesticides and weedicides, the following:
  Aluminium phosphate
  Ammonium sulphamate
  Aurofungin
  Azinophos ethyl
  Azinophos methyl
  Binepacryl
  Calcium arsenate
  Carbophenothion (Trithion)
  Chinomethionate (Morestan)
  DBCP
  Dicrotophos
  Dieldrin
  Disulfotan
  E.P.N.
  Endrin (Technical)
  Ethyl parathion
  Fentin acetate
  Fentin hydroxide
  Lead arsenate
  Leptophos (Phosvel)
  Mevinphos (Phosdrin)
  Mephosfolan
  Nitrofen
  Thanite
  Toxaphene
  Vamidothion
  2,4,5-T
  Synthetic pyrathroids:
    Decamethrin
    Permethrin

Cypermethrin
Fenvalerate
Weedicides:
Metabenzthiazuran
Metoxuron
Isonicotinic acid hydrazide
Meta di-nitro benzene
Methapyrilene and its salts
Methaqualone base and methaqualone hydrochloride
2-Methyl imidazole
2-Methyl-4,5-nitro imidazole
Methyl dopa
Metronidazole
Monochloro benzene
Morpholino propionitrile
Niacin/Nicotinic acid/Niacinamide/-Nicotinamide/3-pyridine-carboxylic acid amide
Nialamide
Nitrobenzene
Organic surface active agents viz. Sulphonated dedecyl benzene/alkyl benzene (acid slurry)
Ortho nitrochloro benzene
Ortho nitro toluene
Oxytetracycline
Para amino phenol
Paracetamol
Para acetyl sulphaguanidine
Para nitrochloro benzene
Para nitro toluene
Para sulphonyl chloride
Para toluene sulphonic acid
Phenol/urea/melamine formaldehyde moulding powder/tubes/-sheets/rods (all types except electrical grade moulding powder)
Phenacetin
Phenyl methyl pyrazolone
Practalol
Propranolol hydrochloride
Resorcinol
Riboflavine-5-phosphate sodium
Saccharine/sodium sachharine
Sodium benzoate
Sodium cyanide
Sulphacetamide and sulphacetamide sodium
Sulphadimidine (sulphamethiazine)
Sulphaguanidine
Sulphamethoxazole
Sulphanilamide
TMA (Trimethoxy benzyl morpholine acrylonitrile)
Tetracycline base/HCl
Thiothamine
Tolbutamide
Trimethoprim
Vitamin B-1 (Thiamine HCl/Thiamine mononitrate)
Vitamin B-2
Vitamin D-3
Vitamin E
Vitamin C
Vinyl acetate

(iii) Limited Permissible Items

Acetaldehyde
Acetarsol
Aceto acetanilide
Aceto acet compounds, specified
Aceto acet ortho chloro anilide (AAOCA)
Aceto acet ortho toluidine
Acetone
Acetyl derivatives of sulpha drugs
Acetylene black
Acrylic ester monomers namely, ethyl acrylate, butyl acrylate, methyl acrylate and 2-ethyl hexyl acrylate
Acrylic plastic sheets/offcuts, other than acrylic plastic sheets of 0.85 mm to 1.2 mm thickness
Acrylonitrile
Activated Carbon
Allyl isocyanate
Alpha naphthylamine
Aluminium chloride
Aluminium hydroxide gel
Aluminium powder/flakes except industrial explosive grade
Aluminium stearate
Amino anthraquinone
4-Amino diphenyl amine
Aminophylline
Ammonium bicarbonate
Ammonium bromide
Ammonium carbonate
Ammonium chloride (industrial and battery grades)
Ammonium chromate, other than analytical reagent grade
Methyl methacrylate monomer (virgin/regenerated)
Ammonium molybdate
Ammonium phosphate (mono and di)
Amyl acetate
Amyl salicylate
Anthrallic acid
Anthranilic acid
Anthraquinone
Anthraquinone sulphonic acid sodium salt
Antipyrine benzene sulphonate
Antipyrine/phenezone (1-phenyl-2,3-dimethyl-5-pyrazolone)
Aurantine (for aurantial or argeol)
Barium carbonate
Barium chloride
Barium chromate, other than analytical reagent grade
Barium nitrate
Barium polysulphide
Barium stearate
Barium sulphate
Barium sulphide
Belladona extracts
Benzanthrone
Benzidine (free base)
Benzoic acid
Benzyl alcohol
Benzaldehyde
Bephenium hydroxynaphthoate
Beta amino anthraquinone
Beta naphthol
Bismuth chromate other than analytical reagent grade
Bismuth citrate
Bismuth oxychloride
Bismuth salicylate
Bismuth subcarbonate
Bismuth subnitrate
Borax
Borneol/iso-borneol and its esters including bornyl acetate, but excluding isobornyl acetate
Bromo benzanthrone
Buclizine and its salts
Butanol (normal and iso) but excluding secondary and tertiary butanol
Butyl acetate
Butylated hydroxy toluene/ditertiary butyl para cresol
Butyl titanate
Cadmium compounds, specified
Calcium borate
Calcium carbide
Calcium carbonate

Calcium compounds, other specified
Camphene
Camphor
Caprolactum
Carbon black excluding channel black and lamp black for rubber goods manufacturing industry
Carbon tetrachloride
Carboxy methyl cellulose and its salts, except dental grade
Casein
Catalysts, specified
Cerium nitrate
Cetrimide
Chemical additive for lubricating oils/fuels
Chemicals for metal treatment based on phosphoric acid
China clay (other than ball clay)
Chloral and chloral hydrate including preparations thereot
Chloramphenicol powder and chloramphenicol palmitate, excluding chloramphenicol stearate and chloramphenicol sodium succinate
Chlordiazepoxide, its salts and derivatives
Chloridine hydroxide
Chlorinated paraffins
Chlorinated tri-sodium phosphate
1-Chloroanthraquinone
Chlorobutol
Chloroform
5-Chloro-o-toluidine
Chlorosulphonic acid
Chlorotetracycline and its salts
Choline and its salts
Chrome alum, potash, other than analytical reagent grade
Chrome colour and burns-wick green
Chromic acid
Chromium sulphate (basic)
Citral
Citric acid
Citronella oil
Citronella pure
Citronellyl acetate
Clofibrate
Coal tar disinfectant fluid (black)
Coal tar naphtha
Cobalt acetate
Colchicine
Compounded electroplating salts of nickel, copper, silver, zinc, cadmium, tin, chromium, brass, etc. and their brighteners and levellers
Copper compounds, specified
Cryolite (including technical)/aluminium fluoride/sodium aluminium fluoride
Cumin oil
Cyclizine and its salts
Cyclohexylamine
Cinnamyl acetate
3-Cyanopyridine
Cypermethric acid/chloride/DVO
Dextropropoxyphene base
Dextrose anhydrous
Dextrose monohydrate
Diacetone or diacetone alcohol
Diagnostic agent - VDRL antigen
1-4; 1-5; 2-6 Diamino anthraquinone
4:4 Diamino stilbene disulphonic acid
3:3 dichloro benzidine dihydrochloride base and its salts
2:5 dichloro nitro benzene
4,7-Dichloroquinoline
1-(2:5) dichloro-4-sulphenyl-3-methyl-pyrazolone
Diethyl carbamazine and its salts
Diethyl carbanyl chloride
Diethyl ether
Diethylene glycol
Diethyl malonate
Diethyl meta aminophenol
Diethyl ethanolamine
Dihydrostreptomycin base and its salts
1:4 Dihydroxy anthraquinone (quinizarine including leuco quinizarine)
1:5 Dihydroxy anthraquinone
Dimethyl benzimidazole
Dimethyl ethanolamine
D.M.T.
Dinitro stilbene disulphonic acid
Diosgenin
Dipentene
Diphenyl amine
Disodium phosphates
D-Oxyphene HCl
D-Oxyphene base
Organic pigment colours and oil soluble colours such as:
Helio fast yellow 12G (Pigment green) C.I. No. 10
Permanent yellow HR (Pigment yellow) C.I. No. 83
Permanent carmine FBB (Pigment red) C.I. No. 146
Quinazarine green base C.I. No. 1656
Pigment green B C.I. No. 10006
Oil yellow AM C.I. No. 11020
Hansa yellow 5G C.I. No. 11660
Hansa yellow 10G C.I. No. 11710
Oil brilliant yellow C.I. No. 11800
Hansa yellow G C.I. No. 11860
Oil yellow AR C.I. No. 11920
Oil brown D C.I. No. 12020
Oil orange ES C.I. No. 12055
Fast orange C.I. No. 12060
Para red C.I. No. 12070
Brown toner C.I. No. 12071
Signal red/red toner R C.I. No. 12085
Oil range T C.I. No. 12100
Toluidine red C.I. No. 12120
Oil brilliant scarlet C.I. No. 12150
Oil scarlet C.I. No. 12155
Oil red 2R C.I. No. 12170
Pigment fast maroon C.I. No.12305
Permanent red F4R C.I. No. 12335
S.F. Maroon C.I. No.12350
Helio fast red BB C.I. No. 12370
Permanent bordeaux F2R C.I. No. 12385
Permanent red FRLI C.I. No. 12460
Permanent carimine FB C.I. No. 12490
Oil yellow PX C.I. 12740
Helio fast yellow 12G C.I No. 12775
Lake red D C.I. No. 15500
Lake red DBA C.I. No. 15500
Lake red DCA C.I. No. 15500
Red lake C/LC/vulcan red C.I. No. 15585
Lithol red C.I. No. 15630
Brilliant lake red R C.I. No. 15800
Rubline toner C.I. No. 15850
Permanent red 2B C.I. No. 15865
Maroon toner C.I. 15880
Golden yellow GR C.I. No. 20045
Benzidine yellow C.I. No 21090

- Vulcan fast yellow CG C.I. No. 21095
- Benzidine yellow C.I. No. 21100
- Permanent yellow GG C.I. No. 21105
- Permanent orange G C.I. No. 21110
- Vulcan fast red B C.I. No. 21120
- Fast orange R C.I. No. 21160
- Oil red G C.I. No. 26100
- Oil red C.I. No. 26105
- Oil black C.I. No. 26150
- Peacock blue C.I. No. 42025
- Lake green C.I. No. 42040
- Lake violet toner C.I. No. 42535
- Oil violet C.I. No. 42535B
- Solvent blue 4 C.I. No. 44045
- Lake Pink C.I. No. 45160
- Dibromofluorescein C.I. No. 45370
- Tetrabromofluorescein C.I. No. 45380
- Quinoline yellow C.I. No. 47000
- Nigrosine C.I. No. 50415
- Phthalocyanine blue C.I. No. 74160
- Phthalocyanine green C.I. No. 74260
- Oil black C.I. No. 77011
- Oil blue C.I. No. 77450
- Vat blue I C.I. No. 73001
- Indigo vat blue C.I. No. 73000
- Reduced vat blue I C.I. No. 73001
- Metal complex dyes such as:
  - Yellow GR C.I. No. 13900
  - Blue 2G C.I. No. 14880
  - Violet C.I. No. 15685
  - Black walk C.I. No. 15711
  - Orange G C.I. No. 18745
  - Brown B
- Disperse dyes
- Reactive dyes
- Vat dyes
- Dyes for acrylic fibres

Divinyl benzene styrene copolymers
EDTA and its sodium salts
Emetine hydrochloride
Emulsions of polyvinyl acetate/acrylate and copolymers
Epoxy/epoxide resins other than for use in electronics industry
Ethinyl estradiol
Ethyl acetate
Ethyl alcohol
Ethylamine (mono, di, tri)
Ethyl chloride
Ethyl oleate
Ethyl phenyl acetate
Ethylene diamine and its derivatives, namely, diethylene triamine, triethylene tetraamine and polyamine
Ethylene urea
Eucalyptus oil (all grades)
Eugenol acetate
Ferric chloride
Ferrous compounds, specified
Formaldehyde (including para formaldehyde)
Frusemide
Fumaric acid
Furfural
Furazolidone
Gambier extracts
Geraniol
Geranyl acetate
Glybenclamide
Glycol ethers
Glyoxal
Guaicol glyceryl ethers
Halogenated derivatives of hydroxyquinoline, specified
Heparine
Heptaldehyde (fatty aldehyde)
Hyaluronidases
Hydrate of alumina and glass white
Hydrazine hydrate/sulphate
Hydrazine hydrochloride
Hydrochloric acid
Hydrofluoric acid
Hydroquinone
Hydroxyquinone
Hydroxy cintronellal
Ibuprofen
Insecticides, pesticides and weedicides such as
- Alpha naphthyl acetic acid
- Barium carbonate
- Carbaryl
- Carbendazim
- Chlormequate chloride
- Copper aceto arsenate
- Copper oxychloride
- Coumachlore
- Dichlorvos
- Diuron
- Ethion
- Ethylene dichloride and carbon tetra chloride mixture
- Ethyl mercury chloride
- Fenitrothion
- Fenthion
- Ferric dimethyldithio carbamate (Ferbam)
- Fluchloralin
- Formulations of those pesticides which are based on technical pesticides included in OGL
- Lindane
- Lime sulphur
- Metaldehyde
- Methoxyethyl mercury chloride
- Nickel chloride
- Nicotine sulphate
- Oxydemeton-o-methyl (metasystox)
- Para dichloro benzene
- PCP
- Paraquat dimethyl sulphate/paraquat dichloride
- Phenyl mercury acetate
- Phosalone
- Phosphamidon
- Pyrethrum -- preparations containing this item
- Quinalphos
- Streptocycline
- TCA
- Warfarin
- Wettable sulphur/sulphur dust
- Zinc phosphide
- Zinc dimethyl dithiocarbamate (Ziram)

Ionone 100% including pseudo ionone
Iron ammonium citrate
Iron bromide
Isobutyl phenyl acetate
Iso nicotinic acid
Isophane
Iso propyl antipyrine
Isoxamine
Ketonic resins
Lactic acid
Lanolin anhydrous/adepts lanae/-wool fat (all grades) excluding wool grease
Lanthanum oxides/salts
Lauryl peroxide
Lead nitrate
Lead stearate
Lemon grass oil

Lignocaine and lignocaine hydrochloride
Litharge/red lead/white lead
Magnesium compounds, specified
Mebendazole
Meccozine and its salts
Melamine
Menthol, all grades
Meprobamate
Mercurochrome
Mercury chloride (mercurous and mercuric)
Mercury iodide
Mercury oxide
Meta amino phenol
Meta chloro phenyl methyl pyrazolone
Meta nitroaniline
Metanilic acid
Meta nitro chloro benzene
Meta nitro paratoluidine
Meta nitro toluene
Meta phenylene diamine
Methacarbamol
Methamine mandelate
Methylamine (mono, di and tri)
Methyl aceto acetate
Methyl chloride
Methylene chloride
Methyl ethyl ketone peroxide
Methyl, ethyl and propyl esters of parahydroxy benzoic acid
Methyl ionone
Methyl phenyl acetate
Methyl salicylate
Methyl testosterone
Mono chloro acetic acid and its salts
Mono methyl amino antipyrine
Mono sodium phosphates
Musk ambrette
Naphthol colours
N-acetyl sulphanilyl chloride
N-Butyl diethyl malonate
N-Butyl malonic acid
Naphthionic acid/sodium naphthionate
Nickel compounds, specified
Nitrocellulose
4-Nitro diphenyl amine
Nitro furantoin
Nitro furazone
N-Methyl piperazine
N:N dimethyl aniline
Nitroso diphenylamine
Nonyl phenol
Octyl titanate and other titanium alkoxides
Oleoresin capsicum
Oleoresin ginger
Oleoresin pepper
Organic surface active agents such as:
- Ethylene oxide condensates as specified
- Imidazolines, betairs, propionates, amino oxides
- Quarternary ammonium compounds, like alkyl triethyl ammonium chloride etc. or any speciality compounds
- Sodium lauryl ether sulphate and sodium lauryl sulphate
- Triethanolamine lauryl sulphate

Ortho anisidine
Ortho dichlorobenzene
Ortho nitro aniline
Ortho nitro anisole
Ortho phenylene diamine
Ortho toluene sulphonamide
Ortho tolidine (O.T. liquid)
Oxalic acid
Oxyphenyl butazone
Paints
Paints driers (naphthenates, octoates, linoleates, etc. of lead, cobalt, manganese, zinc, calcium, etc.
Palmarosa oil
Palladium chloride
Papain
Para amino salicylic acid and its salts
Para anisidine
Para cresyl acetate
Para nitro phenol and its salts
Para nitrotoluene-o-sulphonic acid
Paraphenetidine
Para toluene sulphonamide
Para toluidine
Penta chlorophenol and its sodium salts
Pentaerythritol (all grades)
Pepper oil
Peppermint oil (ex Mentha arvensis)
Peptone
Phenazopyridine
Phenazopyridine hydrochloride
Phenobarbitone
Phenolic/urea/melamine/alkyd/-maleic resins/compositions
Phenothiazine including phenothiazine dispersible
Phenyl acetic acid
Phenyl acetamide
Phenyl butazone
Phenyl ethyl acetate
Phenyl ethyl alcohol
Phenyl ethyl phenyl acetate
Phosphorous (amorphous) i.e. white/yellow phosphorous
Phosphorous pentoxide
Phthalate plasticizers
Phthalic anhydride
Phthalyl sulphathiazole
Picoline, alpha
Pine oil
Pine tar
Plasticizer alcohols (C_6 to C_{12})
Polyester resins (unsaturated)
Polyethylene glycol
Potassium compounds, specified
Precipitated silica (excluding colloidal and fumed)
Probenocid
Progesterone
Prussian blue
Pyrazinamide
Rare earth fluoride
Rifampicin
Rubber chemicals, specified
R. salt
Salbutamol
Salicylamide
Santonin
Saturated fatty alcohols (C_8 to C_{18})
Sera and vaccines, specificed
Silica gel
Silicone emulsions
Silver nitrate
Sodium compounds, specified
Sodium metal
Sorbitol
Soya amines including primary, seondary, tertiary & quarternary
Stearyl acetate (phenyl methyl carbaryl acetate)
Strontium carbonate
Strontium nitrate
Styphynic acid
Styrenated phenols
Succinates other than succinyl succinate

Sulfamic acid
Sulphadiazine
Sulphamethazole
Sulphanilic acid
Sulphaphenazole
Sulphate of alumina (ferric and iron free)
Sulphathiazole
Synthetic ion exchange -- cation exchange resins only
Synthetic rubber as specified
Tannic acid
Terephthalic acid (TPA)
Terbutalin
Terpenyl acetate
Terpeneol
Tertiary butyl catechol
Testosterone, testosterone propionate, testosterone valerate and testosterone enamthate
Tetramisole hydrochloride
Titanium dioxide (both anatase and rutile grade)
Theophylline ethanoate of piperazine
Thiacetazone
Thorium compounds (thorium nitrate and thorium oxide)
Tinidazole
Tricalcium phosphate
Tricholine citrate
Trichlorobenzene
Trichloroethylene
1:7:7 Trimethyl bicyclo [2,2,1]-2-heptanone and/or 1:7:7 heptone
Triple superphosphate (industrial grade)
Trisodium phosphate
Ultramarine blue
Undecylenic acid
Vanadium pentoxide/vanadium pentoxide catalysts
Vetiver acetate
Vitamin B-6 (Pyridoxin HCl/pyridoxin base) and intermediates of pyridoxin
Vitamin B-12
Yara yara (beta naphthol methyl ether)
Yohimbine hydrochloride
Yttrium concentrates
Zinc chloride
Zinc oxide
Zinc stearate
Zinc sulphate
Zinc undecylenate

(iv) Canalised Items

Through Balmer Lawrie & Company:

Paraffin wax

Through State Trading Corporation of India (STC)

Alkyl benzene including linear alkyl benzene/dodecyl benzene
Crude/mineral sodium borate
DDT technical and 75 WDP
Methanol
Natural rubber

Through Minerals & Metals Trading Corporation of India (MMTC)

Fluorspar (acid grade)
Lead
Mineral phosphate
Primary nickel, all types
Platinum
Palladium
Rock phosphate
Sulphur, non-processed elemental/non-refined including sulphur recovered as a by-product of petroleum refining.
Tin
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Chromium oxide/chromium and chromium oxide plated/coated flat rolled products of all grades of non-alloy steel (marketed as tin free steel) in any finish

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Through Indian Oil Corporation Ltd.

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Naphtha
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All types of lubricating oils
All types of petroleum jellies
Toluene
Turbine oil
White oil
Raw petroleum coke
Bitumen (asphalt) - paving grade
Crude spiked with LPG

Through Minerals & Metals Trading Corporation

Nitrogenous fertilizers:
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- Urea
- Ammonium sulphate nitrate
- Calcium ammonium nitrate
- Nitrate of ammonia (ammonium nitrate)
- Nitrate of soda
- Nitrate of lime
- Calcium cynamide

Phosphatic fertilizers
- Triple super phosphate
- Mineral super-phosphate
- Basic slag

Potassic fertilizers
- Sulphate of potash
- Muriate of potash (potassium chloride other than indl. grade)

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- Ammonium phosphate of various grades
- Ammonium nitro phopshate of various grades
- Mono ammonium phosphate
- NPK complex fertilizers of various grades

Through State Trading Corporation of India Ltd.

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Palm kernel oil
Palm stearine
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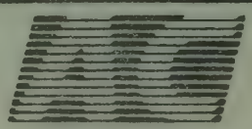
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Chemical News From Abroad

ICI DIPRIVAN UNIT FOR ITALY

ICI is investing L35bn ($28.1m) in a plant at Caponago, near Milan, Italy, to produce its new injectible anaesthetic, Diprivan. The unit, designed by Foster Wheeler Italia, is due for completion in September, 1990 and at full capacity will produce 50m vials per year of the anaesthetic. Michael O'Brien, ICI's regional pharmaceuticals manager said the project would be "ICI's largest European drugs investment in 1988".

The UK company already has one pharmaceuticals preparations plant in Italy and the company's drugs turnover in the country is expected to be L452bn in 1987, of which 90% is exported.

The ICI executive estimated world sales for Diprivan would reach L100bn by 1990, by which time it aims to market the product in 50 countries.

O'Brien said the investment reinforced ICI's interest in the Italian drugs market — which is the fifth largest in the world and has good growth prospects. ICI is believed to be interested in buying the major Italian drugs firm, Erbamont, from Montedison, although the drugs company is not for sale, Montedison says.

ICI hopes to win approval to market Diprivan in the US in the first half of this year. The market there for this type of drug is estimated at $156m. One of its main attractions is that it allows quick recovery after surgery, allowing patients to leave hospital sooner.

ICI is currently in 57th position in the Italian drugs market with a 0.6% share, although it hopes to move up into the top 20. Other new products to be launched in Italy later this year include Zoladex prostate cancer drug, Zestril hypertension drug and Corwin drug for heart failure.

The new Diprivan factory will be used to supply the whole of ICI's worldwide market needs in addition to Italy. Currently the anaesthetic is sold in Belgium, Denmark, France the Netherlands, Ireland, Sweden, Switzerland and the UK.

SOLVAY, CdF LODGE INQUIRY APPEAL

Solvay and CdF Chimie have both recently made procedural appeals to the European court of justice in Luxembourg against a decision by the European commission requiring them to submit further evidence in the current cartel inquiry.

The companies offices were raided, along with those of six other European polyethylene and PVC producers, just over a year ago in a major swoop by EEC inspectors.

From the beginning the chemical concerns have challenged the legality of the inquiry, starting with a refusal by West Germany's Hoechst to give inspectors access to its files. Dow Nederland also failed to halt the inquiry by disputing the right of the commission to use documents seized.

Late last year, as the pace of the inquiry was stepped up by the commission, further information was sought from the companies involved. The latest move by Solvay and CdF Chimie—described by one observer as "more skirmishing" on behalf of the chemical companies concerned — involves an appeal against having to answer more questions from the commission. The companies are partly basing their appeal on the right not to have to give evidence to be used for self incrimination.

Solvay also notes that many of the further questions involved IdPE with which it is not concerned.

A main appeal from Dow Nederland, Dow Spain and Repsol challenging the validity of the commission's investigation is still to be heard.

KAISERTECH QUITS CHEMICALS BUSINESS

Kaisertech is set to move out of the chemicals sector as it reached agreement on the sale of its remaining chemical assets. The proposed deals involve La Roche Chemicals, a management group, purchasing the industrial chemicals operations; Molson subsidiary, Diversey Corp, buying the specialities division FarBest; and Reilly Tar & Chemical Corp buying the brine chemicals business in Utah.

Previously Kaiser Tech announced it had reached an agreement in principle to sell its Harshaw/Filtrol speciality chemicals partnership to Engelhard Corp for $264m. The deals are expected to fetch $350m in total, most of which will go toward reducing the group's debt.

The agreements are subject to regulatory approvals. Sources say it is possible that the US federal trade commission will investigate the Harshaw/Filtrol deal, as Engelhard is already a leader in specialities.

KIO AND CROS TIGHTEN GRIP ON SPAIN'S ERT

The Kuwait Investment Office (KIO) and its two Spanish satellites,

Torras Hostench and Cros, appear to have gained effective control of ERT, Spain's largest private chemicals group. Last week it was revealed that the Kuwaiti led group had raised its voting rights to over 50% with the transfer of participative credits previously held by the Bilbao and Hispano Americano banks, two of ERT's main creditors.

Local observers believe that other creditor banks, frustrated at their failure to agree a new debt repayment scheme with ERT, will now follow suit. If this happens, the KIO axis will have no problem outvoting ERT chairman Jose Maria Escondrillas and agreeing, without his consent if necessary, to a refinancing scheme.

It is understood that the KIO group is currently reluctant to force Escondrillas to resign or to call an extraordinary general meeting of the company. Instead, the Kuwaiti grouping wants Escondrillas to accept Francisco Godia, currently boss of Cros, as vice chairman. Most observers now believe, however, that Escondrillas' days are numbered.

The struggle for control at ERT has also caused serious rifts in the Spanish government. Economics minister, Carlos Solchaga, the man who brought Escondrillas to ERT is concerned that the chemicals giant is "strategic" and believes that the company should remain in Spanish control.

Ranged against him, however, is the industry ministry which believes that overseas investment in Spain should be encouraged. The ministry is also known to favour the fertilizer merger between ERT and Cros which Kuwaiti control will almost certainly bring about. Soruces suggest the industry ministry represents the overall cabinet view. If the government signals support for the KIO, and the Kuwaiti grouping moves quickly, it is almost certain that Escondrillas and some of his senior lieutenants will be forced to abandon ship.

Meanwhile, the beleaguered company has announced plans for a major investment package up to 1992. Its implementation, however, is unlikely until debt refinancing has been agreed. The total package is worth Pta 60bn ($526m) or Pta 15bn a year. Some Pta 10bn/year will be allocated to industrial assests and the remaining Pta 5bn to servicing financial commitments. ERT plans to concentrate on improving its assets in the fertilizers and petrochemicals, defence and oil sectors.

In the wake of the failure by ERT and Cros to agree to merge their fertilizer businesses, the government has frozen all funds set aside to finance sectoral restructuring. ERT, however, is pressing ahead with a new Pta 975m plant at Asturias to replace a existing fertilizer facility at La Felguera. ERT's 1987 results are expected to be announced shortly.

UNIROYAL PLANS OMIT EXPANSION

Uniroyal Chemical, recently put up for sale by Avery Inc, its owner of only 18 months, has announced plans to expand output of its crop protection agent Omite.

The company's Brazilian subsidiary Uniroyal Quimica is building a new 1,000 ton/year facility scheduled for start up in the second half of 1989. Final government clearance on the plant's location - probably somewhere in Sao Paulo state—is expected in the next couple of weeks. Output will go to both Brazilian and other Latin American customers.

Omite is described as a highly selective acaricide that kills mites without harming beneficial insects. It is used on orchard crops and others such as tea, corn and strawberries.

Uniroyal currently produces Omite at its plants in Naugatuck, Conecticut and in Italy at Latina. The new plant will help meet the anticipated growth in demand resulting from Dow's withdrawal of its acaricide Plictran.

Omite has over 25% of the worldwide acaricide market and annual sales are in the tens of millions of dollars range.

Meanwhile, companies on both sides of the Atlantic are believed to have expressed interest in the Uniroyal business. Contenders from Japan have not been ruled out either. The US firm manufactures and markets crop protection chemicals, rubber additive chemicals, speciality plastics and petroleum additive chemicals, custom chemicals and elastomers. Sales in fiscal 1987 were $627m.

Avery purchased the Uniroyal business for $710m in October 1986 and planned to buy other businesses in similar areas. But it was unable to find acquisitons "at acceptable prices" and put the company back on the market last month.

Sources say Uniroyal may undergo the same treatment as Stauffer — i.e. sold as a block to a company interested in just one or two of its business areas while the rest goes back up for sale.

CHEVRON BUYS PPG BIOCHEMICALS UNIT

Chevron Chemical has broadened its range of agrochemical products with the acquisition of PPG Industries' biochemicals business. Terms of the deal are not disclosed, but

sources suggest a price in excess of $20m.

The PPG products include Cobra soya bean herbicide, Genate Plus and Rhino corn herbicide, two other weed controllers for field crops called Genep and Furloe, and Sprout Nip, a potato sprout growth inhibitor.

PPG will continue to supply Chevron from its Barberton, Ohio plant for the time being and co-producer Diaz Chemical of Rochester, New York will also supply the products on a toll basis. A Chevron spokesman said the terms of the agreement allows the new owner to make, sell and market the PPG products but it is not certain if Chevron plans to take over manufacture itself.

Chevron's agrochemical sales are estimated at around $200m/year and industry observers have tended to regard it as a lowly player in the market. Recently, however, the company has agreed to set up a US-based joint venture with Japan's Sumitomo to develop and market new products.

The unit's existing products include herbicides, fungicides and insecticides. But at present, three of its main products, Monitor, Orthene and Bolero are "older" agrochemicals. Chevron says it has five new products in the pipeline.

BP ADVANCED COMPOSITES MOVE

BP Chemicals International is in negotiations to acquire French composite materials firm Melco. If successful, the deal will provide BP with a base from which to expand in the important advanced composites market.

Melco which is owned by the Matra group had sales of FF23.3m ($4.6m) in 1987. It operates a modern facility at Limours and output is based on composite material components for the aerospace industry, defence and other industrial applications.

BP Advanced Materials was recently transferred within the group to BP Chemicals International. Total turnover of the business is predicted to be around $210m this year.

Meanwhile, Deutsche BP, the group's West German subsidiary, has indicated it is in the market for acquisition in the chemicals sector. Financing could come from current reserves of around DM2.2bn ($1.3bn).

Deutsche BP described profits on chemicals in 1987 as good despite a slight decline in volume sales. Overall profit rose more than 42% to DM148m and BP says it is looking for a "considerable increase" in 1988.

NESTE GIVES GO-AHEAD FOR PP, EYES PE EXPANSION

Neste's Board last week gave the go-ahead for its $70m investment to double polypropylene capacity at its Beringen plant in Belgium. The Finnish firm has also announced it is considering the expansion of its polyethylene capacity, possibly at the same site.

The company's current PE capacity stands at 620,000 ton/year, rising to 700,000 ton through ongoing debottlenecking work. Plants are located in Kulloo, Finland and at Stenungsund in Sweden. The latest announcement is a clear indication that Neste intends to make use of ethylene supplies from the new Antwerp cracker planned by Finaneste, the joint venture company set up with Belgium's Petrofina. In yet further investment plans, Neste is mulling the installation of a new 20-25,000 ton/year ethylene terminal at Antwerp replacing an existing, smaller facility and allowing it to import and export ethylene supplies as necessary.

A new PE plant at Beringen would be a significant investment as this market has only recently moved into balance and already new investment plans are emerging.

Earlier this month, BP Chemicals International announced plans to increase its UK polyethylene capacity. The UK firm's total PE capacity currently stands at 885,000 ton/year and will climb to 1.135m ton/year on completion of current expansion plans. Exxon is also expanding its PE capacity.

Neste's new PP plant at Beringen will double present capacity to 240,000 ton/year. Based on Himont's Spheripol technology, feedstock to the plant is secured through long term agreements with a number of suppliers. Future supplies will also eventually come from the Finaneste cracker. The new PP plant is due onstream by end 1989.

Neste says the investment allows it to fully utilize the infractructure in Beringen which has a central location with regard to Europe's polypropylene market. Neste's entry into the PP business came only last year when it acquired the Beringen facility from Himont, the world's largest producer of PP.

Another plant currently under construction at Kulloo in Finland is due to start up in 1988 and will give the company a total PP capacity of 360,000 ton/year.

Including the Finaneste cracker, Neste's total investments in Belgium will exceed BF20bn ($565m) by 1991.

COLLOIDS BUYS BEZ

Allied Colloids, the UK speciality chemicals group, has acquired French water treatment firm Societe Bez for pound 2.7m ($1.8m).

Bez has two manufacturing plants near Paris for chemicals used in water treatment and water conditioning. It has sales of around pound 5.5m and employs about 50 people. Allied has had close links with the privately-owned company which acted as a distributor of the UK firm's water treatment products, mainly to the pollution control and mineral processing industries in France. Allied says it will continue to market its products under the Bez name.

The deal marks Allied's first acquisition in the French water treatment chemicals market. It plans to expand through Bez and will introduce Allied technology to the French company's plants.

CARBIDE REJECTS BHOPAL BLAME

Union Carbide has told the Bhopal court that it had no control over or responsibility towards its Indian affiliate, Union Carbide India Ltd. (UCIL), after September 30, 1982, two years prior to the poison gas tragedy. The claims came during the company's appeal against an earlier decision from the court ordering Carbide to pay interim compensation of Rupee 3.5bn.($250m).

Payment of the interim compensation, scheduled for February 17, has been delayed while the appeal is heard. Carbide is claiming that interim compensation is not appropriate because it is an award without trial.

During the appeal hearing, Carbide's lawyer quoted from a judgement made last year by a US circuit court of appeal, stating that the pesticides plant at Bhopal has been constructed and managed by Indians in India. The US court also stated that no Americans were employed at the plant at the time of the accident or visited the plant for more than one year prior to the accident. During the five year period before the accident communications between the plant and the US were almost nonexistent, the judgement said.

While the appeal hearing continues, the Indian government's $3.3bn civil law suit against Carbide has been stayed. Proceedings in the criminal case against Carbide officials will commence on March 12. As we go to the press, we have news that the Bhopal High Court has directed UCIL to pay Rs.250/- crores as interim compensation. A spokesman for the company said any criminal charges were "baseless" and added that the Indian government itself was a 26% shareholder of UCIL.

ICI TAKES STAKE IN SOUTH KOREAN FIRM

ICI has gained its first manufacturing base in South Korea with the acquisition of a majority stake in Pusan based Woo Bang Chemicals. The price of the stake is thought to be around $2m.

Woo Bang is a young company, set up in 1985, specializing in textile chemicals. Its main products include spinning oils and spinning finishes for which Woo Bang is the only local supplier. ICI said sales figures for its new joint venture are not available.

The UK-based chemicals giant says the deal is part of its strategy to increase sales in the Far East. At present ICI sells a number of products to South Korea including textile colours, auxiliaries and pure terephthalic acid. The company is also thought to be interested in producing PTA in Taiwan or Thailand.

LILLY TO DIVEST?

Eli Lilly is remaining silent on speculation that it plans to sell part or all of its agricultural division. But observers believe that one-time restructuring charges incurred by the division in the fourth quarter last year improved the balance sheet and could prelude a sale.

Last year, sales of Lilly's agricultural division rose 10% on 1986 to $748m. But the previous year was very difficult due to the depressed agricultural market and the company faces an increasing challenge from "me too" products since some of its patents have expired.

The business has two parts —agrochemicals and animal health products — both operating on a worldwide basis.

In brief.....

* Fiber Industries Inc., a division of Sterling Group, has completed the acquisition of two polyester textile fibre facilities from Hoechst Celanese. The deal includes the *Fortrel* trademark. Fiber Industries was set up after the FTC required Hoechst Celanese to sell off certain assets in order for the merger of American Hoechst and Celanese to go ahead. The two plants, at Darlington, South Carolina and Fayetteville, North Carolina, have total capacity of around 227,000 ton/year and make Fiber Industries a major player in the US polyester fibres market.

* Dyno Cynamid has purchased Perstorp's amino resins business in a move which strengthens its presence in the woodcoatings sector.

Chemical Markets Abroad

PAKTANK, MATEX HIT BY ROTTERDAM PORT STRIKES

Lightning strikes by the Dutch transport workers' union FNV against major tank storage operators in Rotterdam are disrupting loading and discharging of ships including chemical tankers at several terminals.

The port's largest tank storage company, Paktank, which has some 4.7m cubic metres of storage, was the first to be hit by the dispute when five tankers moored alongside its Botlek terminal were delayed. Matex, part of Van Ommeren Ceteco which has 2.1m cubic metres of storage, has also had slowdowns.

Paktank president Jan Brouwer said the dispute was not only detrimental to Paktank and Matex but gave a bad name to the port of Rotterdam. Matex spokesman Fedius Fokma said: "So far there has been no effect on our business, but it goes without saying that this kind of action is damaging to our operations in the long term". Matex is telling its customers that the dispute is "incidental".

Independent shippers and traders, however, who are obliged to go into these public-user berths are watching developments closely and although most are confident that they will be able to get their products in and out of the port through alternative terminals, one ship charterer said he was drawing up plans for discharge elsewhere.

Another Rotterdam-based trader expecting a chemical cargo soon said he was looking at the possibility of diverting his ship to Antwerp. Paktank's and Matex's terminals are mainly used by traders needing a quick turnaround.

FNV spokesman Koos van der Linden said workers would step up surprise stoppages from four to eight hours and preparations are under way for selective 24 hour strikes whenever there is a ship in dock to be unloaded. He could not say whether collective action would be sufficient to encourage ships to use other ports, but said the union's main aim was to prevent ships going into other Rotterdam terminals and linking up with Paktank's or Matex's pipeline.

FNV has claimed a two per cent wage increase and a 32 1/2 hour working week as well as a lowering of the retirement age to 60 and a guarantee that any investment in new technology will not lead to redundancies.

One stumbling block causing the talks to break down has been the demand for extra payments for working bank holidays. Management believes that the whole package proposed by the union amounts to an 8-9% increase.

Panocean, another independent tank storage operator with some 556,600 cubic metres of storage at Botlek and Pernis is understood to be on the union's blacklist for trying to prise away some of Matex's customers affected by the industrial action.

Van der Linden said this was totally unacceptable to the union and an ultimatum has been issued to Panocean which expires shortly. Panocean said it had not been officially approached by the union and was not expecting any strikes.

PETROCHEMICAL TRADER FOLDS

Swiss Trading concern Sirchem has ceased its petrochemicals activities, although it is retaining its office in Lausanne, Switzerland.

Because of what market sources describe as "differences of mentality and approach" and after a failed management buyout bid, at least four of Sirchem's petrochemicals staff quit to join oil products trader Aectra. These include Peter Hermann and Rene Fresco who both have taken a financial stake in a new petrochemicals arm of the group. The two traders will continue to operate in Lausanne, and orders will be processed through the Brussels office.

Apart from its petrochemical activities, the new venture will also handle industrial chemicals, polymers and fertilizers. On a broader scale it will continue to offer its expertise in countertrade. It will also make active use of Aectra's Houston office.

Aectra is a private limited company based in Houston and Brussels, owned by its founder Mois Mottale and his senior traders. Its $700m/year turnover is mainly in gasoline blending, gasoline distribution and trading and processing of naphthas, avgas, distillate, LPG and crude oil.

Sirchem dates back to 1984 when it was founded by three major partners under the name Sirco (no connection with Serco of Luxembourg and formerly Rotterdam). The three partners were Sears World Trade belonging to Sears Roebuck, the Italian IRI Group and Genoese trading concern Coe & Clerici. Sirco was established in Genoa to handle countertrader to Italian industries,

and had a petrochemicals subsidiary based in Lausanne.

In 1986 Sears Roebuck folded Sears World Trade, Sirco in Genoa went to IRI, and its petrochemicals subsidiary in Lausanne was wholly taken over by Coe & Clerici who changed the name to Sirchem.

ETHYLENE WELL BALANCED BUT TIGHTENING EXPECTED IN Q3

Western Europe's ethylene market is currently well balanced, with spot prices stable and first quarter contract negotiations concluding at DM800-830/ton, some DM20/ton below levels at the end of 1987.

Expected demand growth, coupled with only limited extra capacity from debottlenecking due on stream should lead to a theoretical tightening in the market by the third quarter. But producers and traders alike consider a major hike in ehtylene prices unlikely, with increasing shipments from the Middle East and North Africa able to fill the gaps. Imports approaching 250,000 ton are expected to reach Europe this year, including 150-180,000 ton from Libya, 20,000 ton from Algeria and around 30,000 ton from sources in Saudi and Qatar, ahead of last year's figure of some 180,000 ton.

However, some observers are expressing some short term worries over supply. Four major European crackers are slated for maintenance next month, DSM's number 4 unit in the Netherlands, Shell at Berre, Dow at Terneuzen and Epsi in Portugal. These closures coincide with a spate of turnarounds in Japan and if there are start up delays, as has been seen recently with BP's Grangemouth unit, producers could be forced to hunt for spot material.

But, if there are recently delays in Japan too, it is likely that product from North Africa and particularly the Middle East could be diverted to Far East markets tightening European spot supplies and giving an impetus to spot levels. But a more immediate problem as producers step up operating rates and strive to squeeze maximum ehtylene output from crackers, is a concomitant lengthening of coproduct supply. This is not much of a problem in propylene where demand is good and poised to increase with new PP units due on stream later this year.

However, in butadiene, increasing surpluses have forced spot prices down from $550-570/ton in January to $320-340/ton now. Crude C4 prices have now slipped to $130-140/ ton taking them below naphtha levels, prompting non-integrated producers to begin co-cracking.

However, advantageously low prices of LPG have encouraged producers with coastal crackers including ICI and Dow to start maximising LPG feed to crackers which will help alleviate C4 production surpluses. The move continues a general trend in Western Europe towards lighter feedstocks, the opposite to the trend expected in the rest of the world. Overall, according to predictions by consultant Chem Systems, the severity of naphtha cracking in Europe is projected to decrease from a propylene/ethylene ratio of 0.53 to 0.56 to help balance the tightening propylene market at the expense of ethylene.

In Western Europe ethylene demand is expected to level off later this year as world economic activity dips. Although some producers are still confident of seeing ethylene consumption grow by up to 4%, John Philpot consultant at Chem Systems predicts that growth should be steady at around 1.2%/year between now and 1995 as derivative trade losses bite. Chem Systems' forecasts are generally on the conservative side. Philpot estimates that demand for styrene and VCM should both grow by 1% this year, with ethylene oxide and high density polyethylene slightly ahead at 3%.

However, he warns that growth in low density polyethylene is unlikely to increase at all this year although linear low density polyethylene should continue a rapid rise in excess of 15%. Against this background of low growth, investment in new ethylene capacity — Finaneste's new cracker aside — should be limited to debottlenecking work during maintenance turnarounds.

According to Chem Systems' figures, capacity utilization in the ethylene industry is currently running at around 95% with last year's output of 13.5m ton in Western Europe very close to the teoretical maximum of 14.25m ton.

West European olefin consumption forecast

	1986	1990	1995	Growth %/year
Ethylene	12.8	13.9	14.3	1.2
Propylene	7.5	8.3	8.9	2.0
Butadiene	1.3	1.4	1.5	1.8

West European feedstock projections (%)

	1986	1990	1995
Naphtha/gasoil	82.8	80.3	79.7
LPG	9.9	11.0	11.3
Ethane/refinery gas	7.3	8.7	9.0

Source: Chem Systems

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Biotechnology News

MAB CANCER DRUGS SUCCESS UNCLEAR

Many Biotechnology and drugs firms are attempting to develop cancer therapies based on monoclonal antibody-drug complexes even though the ultimate success of this approach is still not clear. With the Mab-drug optimization being more of a chemical than biological challenge, according to Robert Kupor of Cable, Howse & Ragen, it is not surprising that drug firms appear to dominate the sector.

Eli Lilly and Bristol-Myers, says Kuper, will probably end up leading the field but even these firms are facing problems. Eli Lilly's Mab complex with vinblastine has faced side effect problems in human trials although a similar complex using DAvinblastine in animal tests looks more encouraging, with human trials soon.

Cetus also appears to be having problems with two Mab-complexes for breast cancer and another recombinant Mab-toxin may be restricted to the brain. Other firms reporting disappointing results, according to Kupor, include Xoma and Biotherapeutics.

But these results are not inherently disturbing because the handful of Mabs which have so far been tested are essentially first generation agents, a situation which will be corrected over the next year or two, Kupor claims.

GENENTECH SUES BIOTECH FIRMS

Genentech, the US biotechnology concern, is suing four companies alleging theft of trade secrets relating to recombinant tissue plasminogen activator and blood factor VIII. Genentech is claiming that former employees now associated with Monsanto, GD Searle and Invitron are using its trade secrets.

Genentech is alleging that former employees removed documents and/or laboratory specimens to develop competing products. The suit comes on the heels of Invitron's announcement that Monsanto, Searle and Invitron have developed novel recombinant forms of tpa and that it is to collaborate with Rorer for the commercialization of gene-spliced factor VIII. Rorer and Genentech are involved in a patent battle concerning this product.

Monsanto, Searle and Invitron all claim that the suit allegations are without merit and all intend to contest the claims. "We believe that the primary purpose of the action is to discredit strong competitors and cause confusion in the industry", claims William Strigley, Invitron's executive vice president and chief operating officer.

In addition to the three companies the suit names Alafi Capital, Moshe Alafi, Invitron chairman, Dr. Charles Benton, now Invitron president and chief executive officer and Dr. Christian Simonsen, Invitron's director of molecular genetics.

INOVELF INVESTS IN UK FIRM

Inovelf, the Elf Aquitaine venture capital company, has taken a 27% stake in the small UK-based Northumbria Biologicals. At the same time, deals have been signed between Diagnostics Pasteur and the UK firm to cross market products. Northumbria Biologicals will market products from the Sanofi and Institut Pasteur subsidiary in the UK and the French firm will market worldwide current and future products from the UK company. In Northumbria Biological's portfolio is the only diagnostic test for the cryptosproridium parasite found in Aids victims' stools.

Sanofi's involvement with Northumbria Biologicals marks a further stage in the group's aggressive strategy for diagnostics. Recent developments for Sanofi include the establishment of Diagnostics Pasteur subsidiaries.

DRUG MAJORS EYE PUERTO RICO

Pharmaceutical majors are expected to invest over $1bn in facilities and equipment in Puerto Rico over the next two years according to Antonio Golorado, head of the island's economic development administration (EDA). The EDA is currently negotiating with 15 pharmaceutical companies for projects with combined investments estimated at more than $630m, he says.

ICI has already started up a $24m plant to produce Tenormin and Tenoretic, drugs used in hypertension and cardiovascular diseases. Puerto Rico is attractive to drug firms because it is treated as part of the US with all the advantages of being within the US tariff boundary. Other companies investing in Puerto Rico include Genentech. It is building a $40m plant there for the final phase production of Protropin and Activase.

American Home Products is building a $56m facility for its Whitehall Laboratories Advil and Ansin lines. Bristol-Myers which is already building a $70m plant, is investing $54m to expand its complex west of San Juan and is also considering plans for a bulk chemical plant.

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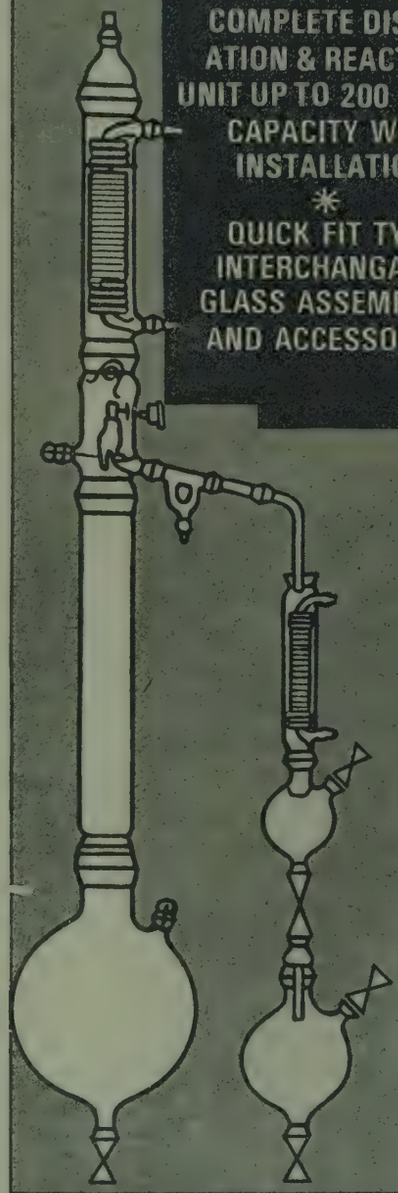
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News from Japan

Denki Kagaku Grace Japan Set Up Construction Mtl. Firm

Denki Kagaku Kogyo K.K., Grace Japan K.K. and Mitsui & Co. established February 18 a joint venture—Denka Grace K.K. —for production and sales of construction materials such as chemical admixtures of concrete, fireproof sheets and fire-resistant sprays. The ownership basis is 45% each for Denki Kagaku and Grace Japan, and 10% for Mitsui.

This project is intended to strengthen their foothold in the Japanese construction-material market. Denki Kagaku holds the largest share of the Japanese market for cement-based construction materials, and W.R. Grace of the U.S.—parent company of grace Japan—is also the top supplier of such materials in Australia, the U.S. and the Asian region south of Hong Kong.

On this occasion, Denki Kakagu and Grace Japan are considering the possibility of technology exchange between themselves.

MITI Adopts Measures To Counter Deaths By Chlorine Gas

Last December a housewife in Tokushima Prefecture was poisoned to death by chlorine gas emitted by a mold-removing agent.

Since then the Ministry of International Trade and Industry (MITI) has carried out examinations aimed at preventing deaths resulting from occurrence of the cases similar to that involving the housewife.

The ministry has decided to adopt such countermeasures as the following: (1) labels having good ideas, (2) notices printed on stickers, and (3) the holding of conferences on the enforcement of safety measures.

In particular, the holding of conferences is considered to be a good way to the public's attention.

Poor Prospects For Future Plasticizer Business Offered

Much expectation cannot be placed on Japanese plasticizer business in view of dull domestic demand and increasing imports in coming years, Association of Plasticizer Industry recently reported. It put yearly domestic demand growth up to 1991 at 0.96% on average and that up to 1996 at 0.64%, while imports are predicted to increase to a little more than 8% of total domestic demand in 1996 due to additional construction in South Korea and Taiwan, etc.

It also pointed out various problems to be solved by the industry with regard to distribution routes. material supply and imports, etc.

The association's survey has been made on the grounds that the situation surrounding the industry has been changing considerably due to the strengthening of the yen and other factors and thus it is necessary to offer business prospects in the new situation from middle-and long-term points of view.

The abovementioned figures are for phthalic acid-based plasticizers and the calculations are based on the assumption that Japan's GNP growth will reach 3% a year during the period involved. In terms of volume, domestic demand for 1991 and that for 1996 are estimated at 361, and 366,000 tons, respectively.

Asahi Chemical To Expand Plastic Product Sales

Asahi Chemical Industry Co. and its affiliated companies intend to nearly treble their sales of plastic products to Y125 billion by 1995.

The company will raise the end-products ratio and produce some products such as food-wrapping film and foamed thin sheet in Europe and America.

Furthermore, the company will quadruple the annual investment value to Y4 Billion.

Branching out into overseas countries, the nucleus of the company's business expansion will be realized in 1990 or 1991. There is a strong probability that it will establish joint ventures with local enterprises.

The company expects annual sales of the products to reach Y20 billion in 1995.

Items to be manufactured are oriented polypropylene film (brand name: Suntec S) and meat-packaging multilayer film (brand name: Barrialon CX), etc.

Regarding food-packaging film; vinyl-chloride film tends to be shunned from the sanitary point of view, but Asahi Chemical is using polyethylene resin as material. Therefore this is the perfect time for Asahi Kasei to branch out into overseas countries.

The company intends to increase the number of end products carrying the Saran Wrap brand name and the present sales ratio of 17% to 25%.

Recently the company has been importing tableware for microwave-oven use from enterprises in the United States and selling it here in Japan.

Environment Agency Pushes Spread of Methanol Cars

As one of a package of air-pollution countermeasures, the Environment Agency plans to consolidate the spread of activities related to synthetic-petrol (methanol) cars.

Under the newly revised law concerning compensation for pollution victims to be enforced this April (fund: Y50 billion), it will provide aid to local governments and the private sector for the introduction of methanol cars.

For this purpose, the agency is at present giving local governments a hearing on the introduction

New Developments from Japan

Monsanto To Scale Up Silicon Wafer Production In Japan

Monsanto Japan Ltd. will scale up around this fall its production capacity for silicon wafers by 50% to 1,500,000 pieces a year (in terms of 5-inch wafers) at its Utsunomiya factory (Tochigi Prececutre). Vice-President C. W. Cook Jr. of the company says : "We would like to further raise the production capacity to 2 million pieces a year depending on supply-demand trends".

The Utsunomiya factory was started up in October, 1986 and is now in full operation : it incorporates finishing, cleaning and checking, processes.

The company commands 4% of the Japanese silicon-wafer market and aims at increasing the market share to 10% within 5 years. It envisages establishing a through-production system at the factory, which will cover single-crystal cutting, wrapping, etching, polishing and epitaxial-growth processes. To this end, the company needs to command more than 10% of the domestic market for silicon wafers.

The domestic market concerned is expected to show a growth rate of about 10% but trade competion aimed at increasing market shares is being intensified with a few big businesses — Nippon Steel and Showa Denko, etc.—entering the business field involved.

Monsanto Co. — the U.S. parent company of Monsanto Japan—has captured 35 and 20% of the U.S. and European silicon-wafer markets, respectively, but several years ago commanded only 1% of the Japanese market, which accounts for about 50% of the global silicon-wafer market. The company has stepped up Japanese operations by constructing the Utsunomiya factory.

Z-Tech To Push Marketing Activitives For High-Purity Zirconia In Japan

Z-TECH, Australia is planning to consolidate marketing activities for high-purity zirconia here in Japan.

The Australian company expects to expand marketing bases in major world markets, taking advantage of opportunities presenting themselves when its 7 million-ton/y commercial plant goes on stream this may, and has firmly established a presence (full-time department) within its allied company in Japan—ICI Japan Limited.

Its most predominant products are the line-up of not only high-purity monoclinic and partially stablized grade products, but ready made products' with dispersants, binders and surfactants added to zirconia powder. The company also has the ability to tailor-make zirconia products to suit customer needs.

In Japan, the company will establish an active presence including technical service bases and, with regard to long-term business, will tackle local production using its own intermediate raw materials.

Production Method For Reverse Transcriptase Pioneered

The Research Development Corporation of Japan has confirmed successful development of new production technology for high-quality reverse transcriptase. With the new technology, the substance is efficiently produced from avian myelogenusleukemia virus (AVM), which has been proliferated in chickens.

The corporation commissioned Nippon Institute for Biological Science and Takara Shuzo Co. to produce the virus having reverse transcriptase and refine the material obtained from the virus, respectively.

Japan has hitherto almost entirely depended on imports of reverse transcriptase but the new technology will help to domestically produce the product.

The product is indispensable to genetic research on higher living things. The new technology will give a great impetus to genetic engineering involving genetic research on cancer and immunity and synthesis of useful biomaterials including insulin and interferon.

Retroviruses including AVM are capable of synthesizing RNA into DNA using reverse transcriptase.

Cybrid Successfully Developed Into Rice Plant : Mitsui Toatsu

Mitsui Toatsu Chemicals, Inc. has succeeded in producing rice plants from cybrids produced from male-sterility rice and a certain variety of rice now under cultivation. This is the first such case anywhere in the world, though Japan Tobacco Corp. and Plantech Research Institute have successfully produced tobacco plants and carrots, respectively, from related cybrids.

The technical breakthrough will serve to markedly reduce the time needed for developing male-sterility rice used as a parent for hybrid rice and transfer plasmagenes to target cells.

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The company produced cybrids from protoplasts obtained from a male-sterility rice plant and the Norin VIII variety of rice. It destroyed the nucleus of the former's protoplast using X rays, inactivated the cytoplasma of the latter's protoplast and fused the two protoplasts by means of an electric fusion method. The callus originating in the fused cell was moved to proliferation media two two weeks after the fused cell was produced and was then moved to differentiation media.

The company analyzed the chromosome number, enzymatic activity and mitochondrial DNA all of the thereby obtained plant and confirmed that the plant has the cell nucleus of Norin VIII rice and a cytoplasma which is a combination of those of the two parent rice plants. The male sterility of the said cybrid will be confirmed two or three months after its production. The male sterility is carried by mitochondrial DNA.

Excellent restorative lines of male-sterility rice are indispensable to rice breeding and the company intends to conduct research on breeding of the restorative lines. It envisages inaugurating two or three years hence field tests on hybrid rice produced using the cybrid technology.

In May, 1985 it succeeded in generating rice plants from protoplasts and since then has successively pioneered biotechnology involving another culture, somatic variation and cell fusion for crops now under cultivation.

Useful characteristics related to photosynthesis and agrochemical resistance are believed to be passed to next generations through cytoplasmic inheritance. Establishment of hybrid technology will encourage development of new rice varieties.

Ultrahigh-molecular-weight Suitable For Injection Molding

Asahi Chemical Industry Co. is contemplating commercializing a new ultrahigh-molecular-weight polyethylene (UHMW-PE), whose molecular weight stands at 1.5-2.0% million, about half that of the company's "Sunfine U" UHMW-PE. The latter is available in two types : one type has a molecular weight reaching 3.8 million and the other, 4.5 million.

The company envisages subjecting the targeted product to injection-molding and screw-extrusion processes, which the company has already developed by itself. Molding methods for Sunfine U are limited to extrusion and compression molding.

It expects the targeted product to be used in production of industrial parts with comparatively complicated shapes. It intends to start commercializing the product when the demand scale concerned reaches a certain level. It aims at diversifying molding processes for the targeted product in a bid to commercialise high value-added polyethylene products.

Ordinary UHMW-PE has a molecular weight reaching 1-6 million and higher abrasion, chemical and shock resistance and nonadhesiveness than high-density polyethylene having a molecular weight of 20, — 20,000. Its molecular weight is so high that it is markedly viscous and difficult to mold.

In Japan, UHMW-PE is commercialized only by Mitsui Petrochemical Industries and Asahi Chemical Industry. Annual demand for the product (molecular weight over 3 million) in this country amounted to about 2,000 tons last year, which includes 500 tons imported from Europe.

Major outlets for the product are lining for silos and hoppers—both of which are used for handling coal, cement and other powder products—and parts (bottle-feeding screws, etc.) for food-production machines.

New Bacterium-derived Substance Found To Decolor Waste Fluids

Researchers led by R. Kurane of Fermentation Research Institute have discovered a new substance produced by a bacterium that can coagulate various colloids and have succeeded in effectively decoloring industrial waste fluids such as liquid wastes from a pulp plant and mother liquor from a fermentation plant.

The new substance has not been identified but is thought to be a polysaccharide protein produced by Rhodococcus erythropolis-S-1, one of the most common bacteria occuring in Japan's soils.

It is the first coagulator obtained from a microorganism. It is also the first time to find that a bacterium-derived substance not only coagulates common colloids but also decolors colored waste fluids.

The substance will attract industrial attention possibly as a new decolorant for industrial liquid wastes since there has been no effective chemical for such use.

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Titanium Dioxide up

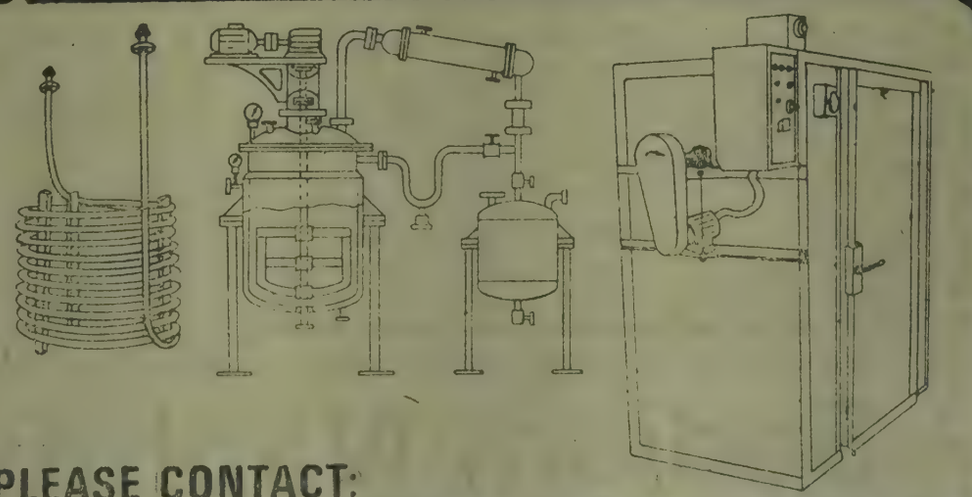
The manufacturers of Titanium dioxide had jacked up the rate by Rs. 3 per kg., resulting an increase in market rates. Styrene monomer had gone up Rs. 3 and there was some shortage in the Bombay market. Paraformaldehyde was also in short supply. The rate had gone up Rs. 3 per kg. Methanol continued to be in short supply. MMTC had increased the price of Zinc metal by Rs. 2 with the result that the salts of zinc had gone up.

The dyes intermediate were normal.

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Thiourea	70+ST
Urea (Tech)	2.75
Vacuum salt	1.00
Zinc Dust	30.00
Zinc Oxide	30.00
Zinc chloride powder (technical)	14.00
Zinc sulphate	4.00

SOLVENTS		Per kg.
Acetic Acid (Glacial)	(Resale)	14.00
Acetic Anhydride	(Resale)	30.00
Acetone	(Resale)	17.00
Adipic Acid		51+ST
Aceto Acetanilide		50.00
Aniline Oil	(Resale)	42.00
Benzoate Plasticiser		33.00
Butyl Acetate		36.00
Butyl acrylate		105+ST
Butyl stearate		36.00
Butanol	(Resale)	35.00
Benzyl chloride		24.00
Benzo trichloride		16.00
Benzoyl chloride		22.00
Bromine Liquid		42.50
Chloroform		24.50
Carbon Tetrachloride		13.00
Cellosolve		47.00
Cyclohexanone		44+ST
Cyclohexanol		43.00
Diacetone	(Resale)	35.00
Diethyl Oxalate		34.00
Diethylene glycol (DEG)		36.00
Dioctyl Phthalate		52.00
Diallyl Phthalate		56.00
Dimethyl Phthalate		28.00
Dioctyl Adipate		52.00
Dibutyl Adipate		42.00
Dipentene		15.00
Dimethylamine 40%		12.00
Dimethylamine 60%		14.00
Ethyl Acetate		24.00
Ethyl Acrylate		46.00
Ethylene Dichloride		11.00
Ethylene Glycol		23.25
Formic Acid (Imp.)	(Resale)	27.50
Formaldehyde	(Resale)	8.00
Glycerine (CP)		50.00
Glycerine (IW)		49.00
Hydrogen peroxide 50%	(Resale)	31.00
Isopropyl Alcohol		19.50
Iso Butyl Alcohol		28.00
Monoethanolamine	(Resale)	45.00
Melamine		54+ST
Morpholine (Indian)		65.00
Methyl Ethyl Ketone		42.00
Methyl Isobutyl Ketone		36.00
Methyl Acrylate		42.00
Methyl Dichloride	(Resale)	22.00

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PHERMONES
CARDIAC GLYCOSIDES
ANTI CANCER DRUGS
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ETHYLENE CHLOROHYDRIN
CALCIUM CARBONATE
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Meta Cresol	45.00
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Polyethylene Glycol (No. 200)	37.00
Polyethylene Glycol (No. 400)	43+ST
Polyethylene Glycol (No. 500)	42.00
Polyethylene Glycol (No. 1600)	14.00
Polyethyene Glycol (No. 4000)	38.00
Polyethylene Glycol (6000)	50.00
Para Cresol	40.00
Styrene Monomer	36+ST
Sorbitol	18.50
Sulphuric Acid	2.10
Trichloroethylene	28.00
Triethanolamine (Resale)	42.00
Turpentine Oil (Germany)	8.00
Turkey Red Oil (50%)	11.75
Triethylamine	50.00
Vinyl Acetate Monomer	41.30

SOLVENTS	Per Litre
Benzene	10.25
N-Heptane	8.00
N-Hexane	8.75
Methanol	8.00
Solvent Naphtha Heavy	9.50
Solvent Naphtha Light	8.50
Toluene	12.50
Xylene	15.00

DYES INTERMEDIATES (PRICES ARE WITHOUT TAX AND EXCISE)

Alphanaphthylamine	60.00
Alpha Naphthol (Imp.)	165.00
Aceto Acetic Ester (Methyl)	63.00
Ammonium Molybdate	180.00
Anthraquinone	70.00
Anthranilic Acid	60.00
2-Amino-4-Nitrophenol (Imp.)	125.00
Blue B. Base (Local)	230.00
Beta Naphthol (Atul)	60.00
Benzidine Dihydrochloride (BDH)	78.00
Bromamine Acid	375.00
BON Acid	105.00
Chicago Acid	280.00
Coach Acid	56.00
C. Acid (Imp.)	260.00
Cyanuric Chloride (Japan)	120.00
2, 4, DNCB	26.00
Dihydrothio PTOS (Imp.)	600.00
Dimethyl Aniline	60.00
Diethyl Aniline	140.00
Di-amino stilbene disulphonic acid	120.00
3, 3-DCB (Imp.)	180.00
Gamma Acid (Atul)	170.00
H. Acid (Atul)	155.00
G. Salt	57.00
Isophthalic Acid	40.00
J. Acid	272.00
J. Acid Urea	275.00
K. Acid	95.00
MDPS (German)	200.00
MNA	76.00
Meta Urido Aniline	135.00
MPD (Local)	120.00
MPD (Japan)	165.00
Naphthenic Acid	12.00
M-Methyl J. Acid	390.00
N-Methyl Aniline	120.00
Naphthalene (Refined)	22.00
Naphthalene (Refined)	24.00
Ortho Anisidine (OA Imp)	85.00
Ortho Dichloro Benzene (ODCB)	10.50
OT Base	92.00
Para Dichloro Benzene (PDCB)	16.00
Para Anisidine (PA-Imp.)	110.00
Para Anisidine (PA-Local)	87.00
PNA	66.00
Para Cresidine (Imp.)	325.00
Para Amino Azo Benzene (India)	125.00
PNCB	28.00
Para Amino Acetanilide	145.00
1-Phenyl 3-methyl-5 Pyrazolone	120.00
Phenyl J. Acid	360.00
Para Amino Benzoic Acid	170.00
PT Base	88.00
Rhoduline Acid	490.00
Resist Salt	20.00
Resorcinol	140.00
Sodium Naphthlonate	63.00
5-Sulpho-Anthranilic Acid	60.00
Sulphanilic Acid	27.00
Sulpho Tobias Acid	100.00
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Tobias Acid	114.00

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Bombay Dyes Market

(Prices as on 6th April 1988)

ACID COLOUR	Per Kg
Acid Violet 4BS	143.00
Acid Maroon V	110.00
Acid Orange II	77.80
Acid Orange IIY	63.05
Acid Red A	107.25
Crosein Scarlet MOG	155.00
Acid Scarlet 3R	99.90
Acid Red 38N	135.00
Acid Red R2R	132.00
Acid Red RS	88.00
Acid Green V	230.00
Acid Patent Blue AS	250.00
Acid Coomasi Blue	200.00
Acid Yellow 5GN	65.00
Acid Red PG	85.00
Acid Red GRS	78.00
Acid Black 10 BX	121.95
Acid Black BX	98.40
Acid Black Wax	135.50
Procinil Yellow GS (ICI, UK)	265.00
Procinil Red GS (ICI, UK)	530.00
Procinil Blue RS (ICI, UK)	315.00
Procinil Scarlet G (ICI, UK)	600.00
Procinil Orange G (ICI, UK)	250.00
Procinil Rubine (ICI, UK)	550.00

DIRECT COLOURS	Per Kg.
Yellow 3GX	88.10
Gun Yellow RCH	124.00
Fast Yellow GCH	141.15
Yellow CFG Hly. Conc.	312.00
Fast Yellow GS	111.65
Fast Yellow CHRS	95.45
Viscose Orange	166.15
Fast Orange GR	133.75
Red	96.90
Dark Tan	78.25
Red IIR	72.55
Red 4B	169.10
Bordeaux BW	132.30
Fast Scarlet 4BS	166.55
Red 12B	170.55
Bordeaux Hly Conc.	194.00
Cotton Red N	117.05
Brill. Fast Helio B	278.00
Brill. Fast Helio 2B	297.00
Brill. Fast Helio 2RS	136.20
Brill. Fast Helio BS	116.10
Brill. Violet Extra	126.40
Blue 2B	86.40
Blue G	170.50
Sky Blue FB	188.25
Copper Blue GR	147.00
Fast Greenish Blue GL	114.60
Developed Black BT	116.10
Blue NB-2B	300.20
Blue NB-2BC	185.30
Developed Black NB-GHB	185.30
Green B	111.65
Green NB-B	188.25
Green 2B-N	188.25
Brown MR	154.40
Brown CN	107.25
Golden Brown G	140.35
Catechin G	120.50
Omega Tan	126.40
Catechin GS	102.80
Black E Hly Conc.	142.60
Black E Extra Hly Conc.	142.60
Black NB-ER Hly. Conc.	310.50

DISPERSOL COLOURS	Per Kg
Yellow 6G Powder	143.80
Red B 3B Powder	247.80
Red B 2B Powder	323.20
Red CB Powder	439.15
Red D2B Powder	477.40
Violet C 4R	521.90
Blue BG Powder	235.45
Blue BN Powder	103.75
Blue D 2R Powder	476.25
Navy BT Powder	243.90
Blue B 2G Powder	210.20
Black BT Powder	182.60
Blue BR Powder	390.20
Yellow 7GL	338.60
Yellow 5RX	218.80
Yellow 3G	367.25
Yellow	140.00
Yellow AL	135.30
Yellow Brown REL	247.50
Yellow FFL	463.60
Gold Yellow GG	259.70
Pink REL	247.00
Red REL	468.65
Red 2B	327.40
Red FB	324.20
Red Violet FBL	469.85
Orange 3R	196.65
Violet 3R	280.00
Violet RL	275.45
Violet 6R	485.75
Scarlet RR	214.85
Rubine 3B	223.05
Rubine CB	364.90
Blue GL	318.95
Blue BGF	636.55
Navy Blue RF	270.40
Brown 3REL	200.40
Black GEL	324.20
Dark Brown 3B	317.40

BASE COLOURS	Per Kg
Fast Yellow	80.20
Fast Orange GC	135.45
Fast Scarlet R	166.90
Fast Scarlet RC	126.65

Fast Scarlet RCR	99.05
Fast Scarlet G	121.65
Fast Scarlet GN	91.50
Fast Scarlet GG	72.70
Fast Scarlet GGS	72.75
Fast Red B	203.20
Fast Red RC	119.15
Fast Red R Flakes	149.25
Fast Red TR	166.80
Fast Red TR Oil	183.15
Fast Red RL	237.10
Fast Red KB Oil	201.90
Fast Bordeaux GP	201.95
Fast Garnet GBC	94.05
Fast Violet B	505.60
Fast Blue BB	521.45

NAPHTHOL COLOURS	Per Kg
ASG	217.00
AS	143.00
ASSW	279.75
ABBS	189.15
ASBO	195.65
ASD	175.50
ASOL	179.35
ASTR	279.75
ASPH	279.75
ASE	196.05
ASEI	184.40
ASLB	1632.60
ASBT	1817.00
ASWG	143.00
ASSG	397.70
ASSR	480.50

PROCION COLOURS	Per Kg
Golden Yellow HR	181.80
Brill. Yellow H4G	117.85
Supra Yellow H-8GP	168.55
Brill. Yellow HE6G	166.95
Yellow H-E4R	276.05
Brill. Yellow H7G	332.30
Yellow M4R	243.95
Yellow M GR	326.05
Brill. Yellow M4G	177.10
Brill. Yellow M8G	332.30
Yellow M 3R	217.60
Brill. Orange H 2R	241.85
Brill. Red H 7B	157.95
Brill. Orange M 2R	313.15
Brill. Red H 85	169.45
Brill. Scarlet H RN	245.05
Supra Red H-3BP	179.30
Brill. Red H-F3B	243.45
Brill. Magenta H8	167.00
Brill. Red M. 5B	98.90
Brill. Red M 8B	173.70
Brill. Pink MB	137.10
Brill. Magenta MB	121.55
Brill. Purple H-3R	180.20
Brill. Purple H-7R	175.40
Navy Blue H 3R	298.50
Brill. Blue H-GR	366.55
Brill. Blue H 5G	173.10
Blue H 5R	283.85
Brill. Blue H 7G	178.70
Brill. Blue H 7RX	358.15
Turquoise HA	234.45
Supra Blue H-3RP	335.70
Supra Turquoise H 2GF	181.50
Blue H 5RX	269.30
Navy Blue H ER	258.60
Blue H-ERD	305.80
Navy Blue M 3R	310.95
Brill. Blue MR	331.70
Brill. Blue M RX	214.20
Brill. Blue M-G	382.30
Blue M 4GD	344.60
Navy Blue M RB	318.75
Turquoise M-G	197.85
Brill. Blue M GX	302.50
Blue 3R Acre Powder	718.20
Dark Brown H 6R	248.45
Cobalt Oxide (per kg)	285.00
Green H 4BD	269.80
Green H-E4B	169.80
Red Brown H IF	143.25
Orange Brown H 28	209.05
Brown M GRN	188.60
Black H-N	283.35

SULFUR COLOURS	Per Kg
Navy Blue	99.85
Green G	105.55
Black Grains Extra	63.05
Black Grains OG	64.55
Black GXE Conc.	61.60
Black GXE	52.75
Black GXR	61.60
Black Grains 800	54.20
Black EXR Grains	64.55
Black EXR Grains 800	51.25

VAT COLOURS (ICI)	Per Kg
Yellow 5G Powder Fine	673.15
Yellow 5G Supra Disperse	439.30
Yellow 5G Acra Conc.	628.75
Yellow 3R Powder	588.85
Gold Orange 3G Pdr. Fine	952.15
Brill. Orange 6R Pdr. Fine	624.35
Gold Orange 3G Supra Disp.	601.30
Brill. Orange 6RX Powder	394.30
Brill. Red 3B Pdr. Fine	997.80
Brill. Red 3B Supra Disp.	713.20
Brill. Purple 4R Conc. Pdr.	470.75
Brill. Purple 3R Acra Powder	690.85
Brill. Purple 2R Hly Conc.	597.90
Brill. Purple 4R Supra Disp.	500.05
Brill. Purple 2R Acra Conc.	625.95
Blue R Powder Fine	542.15
Blue BC Conc. Pdr. Fine	522.50
Blue BC Acra Conc. Pdr. Fine	762.70
Blue R Conc. Pdr. Fine	577.65
Blue RR Supra Powder	629.35
Blue Conc. Powder	645.80
Brill. Blue 2R Hly. Conc.	378.55
Brill. Blue 2R Supra Disp.	115.65
Dark Blue 2R Powder Fine	389.25
Blue BC Supra Disp.	359.40
Jade Green XBN Powder Fine	438.20
Jade Green XBN Acra Conc. Powder	823.90
Jade Green 2G Pdr. Fine	419.65
Jade Green 2G Ptg. Paste	125.40
Jade Green XBN Ptg. Paste	126.00
Jade Green 2G Supra Disp.	496.00
Olive Green B Pdr. Fine	399.90
Olive D Pdr. Fine	444.30
Olive Green B Supra Disp.	308.25
Jade Green XBN Supra Disp. (N)	327.30
Olive OMW Pdr. Fine	698.55
Olive OMW Supra Disp.	538.05
Olive R. Pdr. Fine	422.95
Olive R. Pdr. Fine	422.95
Olive D Supra Disp.	361.70
Olive R supra Disp.	363.90
Olive D. Ptg. Paste	193.00
Olive Green B. Ptg. Paste	199.10
Olive Green B Acra Conc.	542.75
Olive R Acra Conc.	640.00
Olive Green B Acra Conc.	542.75
Brown R Pdr. Fine	835.00
Brown G. Pdr. Fine	795.00
Brown R Pdr. Fine	659.75
Dark Brown 3R Pdr. Fine	685.00
Brown G. Supra Disp.	449.90
Brown 2G Supra Disp.	554.00
Brown R Supra Disp.	422.95
Brown BR Powder	719.00
Dark Brown 3R Ptg. Paste	217.15
Dark Brown 3R Supra Disp.	414.55
Brown G Acra Conc.	733.95
Brown R Acra Conc.	766.00
Grey M. Powder Fine	768.80
Grey M. Supra Disp.	585.45
Blue BC Acra Conc. Pdr. Fine	762.70
Direct Black AC Supra Disp.	330.35
Direct Black AC Pdr. Fine	474.70
Direct Black CH Supra Disp.	393.20
Direct ACD Ptg. Paste	217.15

Madras Market

There was demand for caustic soda flakes on account of reduced production in the manufacturing units. At Mettur production of flakes was temporarily suspended till the middle of the month. Chloromethanes prices went up due to increase in rates by manufacturers. Benzene was under short supply due to non-availability of material from Bharat Petroleum and SAIL.

Also there has been a spurt in the consumption of Benzene in the recent times. Methanol continues to be in demand, as also was the case with xylene. Among the chemicals Hydro has been in the limelight due to reduced production. But there was heartening news for the manufacturers that zinc metal has been brought under OGL list.

(MADRAS MARKET RATES AS ON APRIL 9, 1988)

Acetic Acid — Glacial (per kg.)	16.50
Acid Slurry (Soft) (per kg)	26.00
Aluminium Sulphate Iron free (per tonne)	1,700.00
Ammonium Bi-carbonate (per 25 kg.)	125.00
Ammonium Chloride SPIC (per tonne)	1800.00
Bleaching Powder — Mettur (per 25 Kgs. bags)	100.00
Borax Granular	650.00
Cresylic Acid 100% (per kg.)	85.00
Meta Cresol 40/42% (per kg.)	47.00
Para Cresol 80%/85% (per kg.)	55.00
Caustic Soda Flakes (Mettur) (per ton)	8200.00
Caustic Soda Flakes (Andhra sugar)	8200.00
Citric Acid — Indian (per kg)	43.00
Copper Sulphate (per 50 kg.)	1000.00
Formic Acid (India) (per kg.)	27.00
Formaldehyde (per kg.)	7.00
Glycerine (per kg)	42.00
Hydrosulphite of Soda TCPL (per kg.)	33.00
Hydrosulphite of Soda IDI (per kg)	36.00
Hydrosulphite of Soda BASF (per kg.)	38.00
Hydrogen Peroxide (India) (per kg.)	35.00
Hyflo Supercell	19.50
Magnesium Carbonate Light	18.00
Potassium Bichromate (per kg.)	26.00
Phosphoric Acid (per kg)	17.50
Phthalic Anhydride (per kg)	26.00
Pentaerythritol (per kg)	52.00
Paraffin Wax (per kg)	13.50
Oxalic Acid (per kg.)	20.00
Soda Ash (TAC) (per 75 kg)	325.00
Soda Ash (TATA) (per 75 kg)	320.00
Sodium Cyanide Indian (per kg.)	47.00
Sodium Cyanide Degussa (per kg.)	70.00
Sodium Bichromate (per kg)	19.00
Sodium Bicarbonate (per 50 kg.)	280.00
Sodium Nitrite (per 50 kg.)	650.00
Sodium Nitrate (per 50 kg.)	425.00
Sodium Silicate (per tonne)	4000.00
Sodium Sulphate (per tonne)	3500.00
Sodium Sulphide Flakes (per tonne)	12,500.00
Sodium Bi-sulphite (per 50 kg.)	185.00
Stearic Acid (per kg)	32.00
Trisodium phosphate (per 50 kg)	340.00
Titanium Di-oxide Indian TTP (per kg.)	48.00
Titanium Di-oxide Indian Rutile (per kg)	58.00
Urea Tech (per tonne)	2800.00
Zinc Oxide (per kg.)	34.00
Zinc Chloride Powder (per kg.)	12.00
Zinc Sulphate (per tonne)	4500.00
Di-octyl phthalate (per kg.)	47.00
Di-butyl phthalate (per kg.)	47.00

SOLVENTS

Acetone (H.O.C.) (per kg.)	19.00
Isopropyl Alcohol NOCIL (per kg.)	21.50
Diacetone Alcohol NOCIL (per kg.)	28.50
Benzene SAIL (per kg)	15.00
Diethylene Glycol NOCIL (per kg)	35.00
Butanol NOCIL (per kg.)	33.00
Butanol NOCIL (per kg.)	33.50
Toluene SAIL (per litre)	14.00
Xylene IPCL (per litre)	15.00
Phenol HOC (per kg.)	28.00
Turpentine (per litre)	16.50
Sorbitol (per kg.)	30.00
Trichloroethylene MCIC (per kg)	13.50
Carbon Tetra Chloride (per kg)	15.50
Chloroform (per kg)	26.00
Methylene chloride (per kg)	22.00
Methyl Ethyl Ketone (per kg.)	42.00
Cellosolve (per kg.)	50.00
Triethanolamine (per kg.)	23.00
Ethyl Acetate (per kg.)	22.00
Butyl Acetate (per kg)	42.00

Delhi Market

DELHI: APRIL 8 (NNS) — Hexamine, camphor powder and phenol prices slipped by Rs. 4/9 per kg. as well as formic acid and titanium dioxide drifted lower by Rs. 1/2 in the local chemicals market during the week under review due to improved supply, says NNS. Ammonium chloride and hydrogen peroxide however showed an upward trend. Turnover was moderate.

Camphor powder was cheaper by Rs. 5 at Rs. 88 per kg. owing to stockists offerings caused by acute shortage of money. Hexamine also dropped by Rs. 4 at Rs. 40 due to improved supply and poor enquiries. Phenol also slipped from Rs. 42 to Rs. 33 in the absence of demand.

Formic acid softened by Re. 1 at Rs. 29 on improved supply and slack offtake. Titanium dioxide declined by Rs. 2 at Rs. 64 owing to slack demand by paint and plastic units, whereas titanium dioxide Anatase hardened by Re. 1 due to acute shortage of stocks in the market. Menthol flake and bold advanced from Rs. 165 and Rs. 193 to Rs. 180 and Rs. 207 per kg. due to fall in production. Menthol medium sold was higher at Rs. 197 against Rs. 175. Mentha oil hardened by Rs. 5 at Rs. 140 and DMO quoted higher by Rs. 5 at Rs. 70 on good offtake.

Tartaric acid drifted lower by Rs. 25 at Rs. 7075 owing to good import prospects from France. Citric acid also ruled easy at Rs. 2250/2550, Soda hydro sulphite Tamil Nadu and Damosha up by 50 paise each and Kalali hydro sold higher at Rs. 36.50 against Rs. 36 caused by hike the prices of zinc metal by MMTC recently. Sufolight however softened by 50 paise due to slack demand by gur khandsari manufacturers. Chatkolight and rangolite Germany ruled static at Rs. 50 and Rs. 80 per kg. Caustic flakes eased by Rs. 5/10 at Rs. 400/410 on profit taking selling by stockists.

Soda ash PNFC was dearer by Rs. 5 at Rs. 260 thanks to good offtake, while soda ash Tata softened by Rs. 5 on improved supply. Soda bicarb NAL turned easy by Rs. 5, while soda bicarb Tata edged up by Rs. 5 on good offtake. Sodium nitrite ruled quiet at Rs. 800/850. Acetic acid tumbled down by Rs. 14.50/18 to Rs. 13/13.50 on increased arrivals. Paraffin wax and mercury also ruled easy.

Dyes and colours ruled static in anticipation of hike in prices shortly due to increased excise duty on chemicals.

(DELHI MARKET RATES AS ON APRIL 8, 1988)

Ammonia Bicarb (per 25 kg)	118.00
Mercury (per flask)	9000.00
Soda ash (per bag)	260-290.00
Ammonium chloride (per 50 kg)	115-185.00
Caustic soda solid	No Stock
Caustic soda flakes (per 50 kg)	400-410.00
Citric acid (per 50 kg)	2250-2550.00
Stable Bleaching Powder Shriram (per 25 kg)	95.00
Stable Bleaching Powder KCl (per 25 kg)	85.00
Stable Bleaching Powder MODI (per 25 kg)	93.00
Sod. Bicarbonate (per 50 kg)	255-280.00
Sod. Hydro Sulphite (per kg)	34.50-36.50
Boric acid Technical (per 50 kg)	975-985.00
Paraffin wax (per 50 kg)	575.00
Tartaric acid (per 50 kg)	7,075.00
Borax Granular (per 50 kg)	570.00
Borax Crystal (per 50 kg)	580.00
Sodium Nitrate (per 50 kg)	430-450.00
Sodium Nitrite (per 50 kg)	800-850.00
Camphor Powder (per kg)	88.00
Camphor Thal (per kg)	99.00
Menthol Medium (per kg)	197.00
Menthol Flakes (per kg)	180.00
Menthol Bold (per kg)	207.00
Glycerine (per kg)	43-45
Sodium Silicate (per quintal)	200-250.00
Hexamine (per kg)	40.00
Acetic Acid Glacial	
Copper Sulphate (per quintal)	1800-2100.00
Formic acid (per kg)	29.00
Formaldehyde (per kg)	6.50
Hydrogen Peroxide (per kg)	33.50-34.00
Calcium Carbonate (per tonne)	3500-4000.00
Acid Slurry Soft (per kg)	23.00
Acid Slurry Hard (per kg)	30.00
Phosphoric Acid (per 50 kg)	825.00
Pot. Nitrate (per quintal)	900-1200.00
Pot. Permanganate (per 50 kg)	2300.00
Sod. Bichromate (per 50 kg)	1025-1100.00
Tri-Sod. Phosphate (per 50 kg)	340-350.00
Titanium Dioxide Anatase (per kg)	51.50
Titanium RC-822 (per kg)	64.00
Zinc Oxide (per mt)	32000-38000.00
Phenol Carbolic Acid (per kg)	33.00
Carbon Tetrachloride (per kg)	17.50
Chloroform (per kg)	26.00
Sodium Sulphate (per 50 kg)	155-158.00
Naphthalene Balls (per 50 kg)	1400.00

DYES & COLOURS	per kg
Naphthol AS	150.00
Naphthol ASG	235.00
Naphthol ASBI	200.00
Naphthol ASTR	302.00
Naphthol ASOL	191.00
Naphthol ASBO	208.00

DIRECT DYES	(per kg)
Black E. Conc.	92-155.00
Diazo Black B.T.	125.00
Green B.	119.00
Blue 2-B	86.00
Sky Blue FB	200.15
Basic Auramine 'O' Conc.	65-100.00
Basic Rohdamine B.500%	220-320.00
Basic Methylene Blue	92-130.00
Basic Violet	142-160.00
Basic Malachite Green	160-185.00

Materials Imported

BOMBAY
(From 29.12.87 to 4.1.88)

ALUMINIUM OXIDE : From Belgium : Indag Rubber Ltd., 214 kgs., Rs. 15,300.

ACETIC ACID GLACIAL : From Netherland : Imarco Ltd., 11.900 Mts., Rs. 1,02,878 ; Inaryo Ltd., 29.820 Mts., Rs. 2,57,799.

ACRYLAMIDE : From Malasia : The Diamond Silk & Rayon Mills, 3,000 kgs., Rs. 59,577; 3,000 kgs., Rs. 59,577.

ACRYLIC ACID : From Switzerland : Bakelite Hylam Ltd., 10 kgs., Rs. 1,78,729.

ALDEHYDE C10 : From U.S.A. : Southern Sea Foods Ltd., 35 kgs., Rs. 6,341.

ALLYL CYCLOHEXYL PROPIONATE : From U.S.A. : Southern Sea Foods Ltd., 15 kgs., Rs. 4,923 ; From Germany : Aryavart Chemicals P. Ltd., 50 kgs., Rs. 28,265.

ALLYL HEPTATE : From U.S.A. : Southern Sea Foods Ltd., 25 kgs., Rs. 5,908.

ALPHA NAPHTHOL : From Germany : Advance Magmotape Co., 350 kgs., Rs. 31,484.

ALPHA PHENYL GLYCINE CHLORIDE HYDROCHLORIDE : From Japan : Amar Synthetics, 1,015 kgs., Rs. 3,26,214 ; From U.K.K. : Shreeji Metals & Perro Alloys, 5,775 kgs., Rs. 17,04,972.

ALUMINIUM OXIDE : From U.K.K. : Echjay Electronics P. Ltd., 1,705 kgs., Rs. 1,88,850.

ALUMINIUM OXIDE SYNTHETIC BROWN : From USR : Vindhya Paper Mills Ltd., 2 kgs., Rs. 1,23,124.

AMINO ETHYL ETHANOLAMINE : From China : Oriental Fabrics, 1,000 kgs., Rs. 31,758.

2 - AMINO - 3 - BROMO - 1-CYANO - 5 - NITROBENZENE: From U.K. : Belldom Electricals P. Ltd., 2,109 kgs., Rs. 8,58,123.

AMINOPHYLLINE BP 80 : From Japan : Uptron India Ltd., 725 kgs., Rs. 92,804.

ANTIMONY TRIOXIDE : From Germany : M.B. Metals, 5,000 kgs., Rs. 2,81,606.

AROMATIC CHEMICALS (ACETYL CEDRENE) : From Japan : HMT Bearing Ltd., 1,000 kgs., Rs. 2,63,752.

AROMATIC CHEMICALS FURANEOL 100% : From Switzerland : Pioma Industries, 300 kgs., Rs. 6,89,871.

ARSENIC TRIOXIDE : From Japan : Plasto Traders, 26 Mts., Rs. 1,65,678 ; From Germany : Web Films India Ltd., 8,750 kgs., Rs. 57,921 ; From Spain : Tube Weld Engineering Works Ltd., 25 Mts., Rs. 1,65,678; From Japan : Indian Aluminium Co. Ltd., 8,750 kgs., Rs. 57,921.

ARSENIC TRIOXIDE 98% MINIMUM WHITE POWDER : From U.K.K. : Bombay Decals P. Ltd., 8,750 kgs., Rs. 57,921 ; From Japan : Tata Exports Ltd., 8,750 kgs., Rs. 57,921.

ARSENIC TRIOXIDE 99% : From Singapore : Chawla Plastic Works Ltd., 17,000 kgs., Rs. 1,23,786.

BENZAL ACETONE : From Italy: Mohan Brothers, 540 kgs., Rs. 30,627.

BENZOFURANYL CHLOROFORMATE: From Germany: Everest Kanto Cylinder P. Ltd., 997 kgs., Rs. 1,60,077.

BISPHENOL-A : From UKK: National Engineering Industries Ltd., 3,000 kgs., Rs. 61,191.

BUTYL ACRYLATE MONOMER : From Germany : K.G. Khosalka Compressors Ltd., 1,440 kgs., Rs. 26,690.

n-BUTYL METHACRYLATE : From U.S.A. : P.C. Jain Sons, 30 kgs., Rs. 973.

n-BUTYRALDEHYDE : From U.S.A. : Disco Papers P. Ltd., 1,050 kgs., Rs. 18,817.

CALCIUM FLUORIDE: From Taiwan : Yume Electronics, 400 kgs., Rs. 27,948.

CELLOSOLVE ACETATE : From Germany : Om Book Service, 1,000 kgs., Rs. 17,463.

CHLOROFORM BP/USP : From U.S.A. : Universal Steel Agencies, 5,040 kgs., Rs. 65,507.

CHLORONAPHTHALENE : From Japan : Uttam Galva Steel Ltd., 1 Ltr., Rs. 204.

CHLOROPROMAZINE HCL BP 80 : From Germany : Brown & Burk Pharmaceuticals P. Ltd., 300 kgs., Rs. 1,58,870.

CHLOROQUINE PHOSPHATE BP 80/USP 20 : From China: Sydney and Muller Pharmaceuticals India, 1,000 kgs., Rs. 3,44,218.

CHROMIUM OXIDE : From Germany : Sudarshan Chemical Industries, 200 kgs., Rs. 12,050.

CRESYLIC ACID : From Spain : The Premier Automobiles Ltd., 50,000 kgs., Rs. 7,67,871.

CYCLOHEXANONE : From Japan : Midas Colar Industries P. Ltd., 13.68 Mts., Rs. 1,90,168.

CYCLOHEXYL ISOCYANATE : From Turkey : Cosmos Import and Export Co., 600 kgs., Rs. 1,00,435.

D-PARA HYDROXY PHENYL GLYCINE : From Japan : Labela Pharmaceuticals, 2,000 kgs., Rs. 4,76,610.

DEHYDRO THIO PARA TOLUIDINE SULFONIC ACID : From Iran : P. Harshad & Co., 1,300 kgs., Rs. 3,12,333.

DIBUTYL TIN OXIDE: From Japan : Reine Chemicals, 1,080 kgs., Rs. 1,58,307.

D-CALCIUM PANTOTHENATE : From Spain : Tubetec Engineers P. Ltd., 700 kgs., Rs. 1,18,252.

DICHLORO ACETYL CHLORIDE : From Taiwan : Yume Electronics, 1,000 kgs., Rs. 35,669 ; From Germany : All Chemie, 750 kgs., Rs. 28,475.

1,3, DICHLOROBENZENE : From Brazil : Neelikon Dyestuffs, 1,000 kgs., Rs. 77,250.

2,4, DICHLORO BENZYL CHLORIDE : From Japan : Jal P. Ltd., 1,000 kgs., Rs. 1,55,798; From U.K. : Fancy Creations, 750 kgs., Rs. 1,16,849.

2,3, DICHLORO 1,4 NAPHTHOQUINONE (DICHLONE) : From U.K.K. : IVP Ltd., 500 kgs., Rs. 69,870.

DICYANDIAMIDE : From U.S.A. : K. Uttamlal Export P. Ltd., 32 Mts., Rs. 7,58,737 ; From Singapore : K.K. Enterprises, 16,000 kgs., Rs. 3,71,806.

DICYCLOPENTADIENE: From Germany : Ahmedabad Polymers, 5,075 kgs., Rs. 60,470.

DIMER ACID : From Germany : Virag Enterprise, 15,200 kgs., Rs. 2,17,819.

DIMETHYL COCO AMINE (DISTILLED): From USA: Disco Papers P. Ltd., 1.5 kgs., Rs. 55,605.

DIMETHYL SULPHOXIDE : From Germany : Bombay Cranes P. Ltd., 15,960 kgs., Rs. 3,44,414.

2, 4 DINITRO TOLUENE PURE : From Germany : Alfa-Laval Ltd., 3,500 kgs., Rs. 1,26,824.

DIOCTYL PHTHALATE : From Germany : Advance Magnotape Co., 8,000 kgs., Rs. 87,378 ; From France : Associated Drugs Co. P. Ltd., 4,000 kgs., Rs. 43,689 ; From Canada : Bright Brothers Ltd., 4,000 kgs., Rs. 43,689 ; From Italy : Arjun Impex, 4,100 kgs., Rs. 44,781 ; From Switzerland : Bharat Heavy Electricals Ltd., 4,100 kgs., Rs. 44,781.

DIOCTYL SEBACATE: From France : Ergodyme Electricals Ltd., 185 kgs., Rs. 14,660.

DIPHENYL CARBONATE : From Japan : Uttam Galva Steel Ltd., 1 Ltr., Rs. 2,658.

EPHEDRINE HCL BP 80 : From Korea : The Bhor Industries Ltd., 220 kgs., Rs. 1,29,611; From Finland : Newsprint Trading and Sales Corporation, 200 kgs., Rs. 1,05,913.

EPICHLORO HYDRINE (SOLVENTS) : From Germany: Hotel Oberoi Towers, 5,040 kgs., Rs. 1,10,097.

ETHYLENE GLYCOL MONO ETHYL ETHER : From Germany : Viral Laminates P. Ltd., 11,400 kgs., Rs. 1,31,514 ; From Switzerland : Kirloskar Cummins Ltd., 3,420 kgs., Rs. 39,454.

ETHYL ACRYLATE : From Germany : Ahmedabad Polymers, 6,290 kgs., Rs. 1,18,249.

ETHYL HEXANOIC ACID : From Afghanisthan : Grishul International, 7,030 kgs., Rs. 1,01,262.

ETHYL CELLULOSE : From Indonesia : Dujodwala Resins and Terpenes P. Ltd., 1,000 Lbs., Rs. 69,188.

2-ETHYL HEXANOL : From Australia : Ajanta Paper & General Products Ltd., 26,775 kgs., Rs. 3,79,644.

ETHYL METHYL BUTYRATE : From Germany : Aryavart Chemicals P. Ltd., 50 kgs., Rs. 26,109.

ETHYL PELARGONATE : From U.S.A. : Southern Sea Foods Ltd., 25 kgs., Rs. 7,483.

ETHYL THIO ETHANOL : From U.S.A. : Tide Industries, 1,000 kgs., Rs. 25,154.

ETHYL VANILLIN : From Italy : Uniscans & Sonics Ltd., 500 kgs., Rs. 1,39,011 ; From Iran : Chandrakant Moganlal & Co., 300 kgs., Rs. 88,371.

ETHYLENE ACRYLIC ACID: From Australia : Pawan Enterprises, 4,000 kgs., Rs. 1,11,208.

ETHYLENE CHLOROHYDRINE : From Japan : Bhabha Atomic Research Centre, 2,530 kgs., Rs. 68,757.

FERRIC AMMONIUM EDTA : From Germany : Poly Coates (India), 3,000 kgs., Rs. 87,751.

FERRIC OXIDE GRADE : From China : EN Gandhi Chemicals P. Ltd., 15,160 kgs., Rs. 99,762.

FORMAMIDE : From Korea : Electronics Corporation of India Ltd., 17,940 kgs., Rs. 3,60,361 ; From Hong Kong : Garware Plastics & Polyester, 17,940 kgs., Rs. 3,60,361.

FORMIC ACID 85% : From Germany : Sadhuram & Co., 5,040 kgs., Rs. 37,299.

GAMMA FERRIC OXIDE : From Indonesia : Universal Polymers, 4,000 kgs., Rs. 1,70,930 ; From Iran : Kishan Chand Hiralal, 9,000 kgs., Rs. 7,50,660.

GAMMA PICOLINE : From Japan : Modi Rubber Ltd., 4,940 kgs., Rs. 1,86,894.

GLYCERINE TECHNICAL 98% MINIMUM : From Japan : Asha Plastics, 25,000 kgs., Rs. 4,23,653 ; Shire Laminating & Coating, 25,000 kgs., Rs. 4,23,653.

GLYCERYL MONO STEARATE BP/USP : From Germany: Bombay Pharma Products, 4,000 kgs., Rs. 39,110 ; 4,000 kgs., Rs. 39,110; From Pakistan: Rameshlal Bhagwandas, 5,000 kgs., Rs. 48,888.

GLYCINE NF : From Iran: Beena Maheshlal, 1,000 kgs., Rs. 40,976; Mala S. Ahuja, 1,500 kgs., Rs. 61,465.

GLYCOLIC ACID N-BUTYL ESTER : From Germany: E.T.

& T. Development Corporation Ltd., 2,000 kgs., Rs. 96,890.

GLYOXAL 40% : From Japan: Ashish & Co., 6,000 kgs., Rs. 67,520; 5,000 kgs., Rs. 56,266; From Germany: Unique Pharmaceutical Laboratories, 52.500 Mts. Rs. 5,39,844; 52.500 Mts., Rs. 5,39,844.

GUM ARABIC MIXED GRADES : From Nigeria: Dealfast Exports P. Ltd., 16,000 kgs., Rs. 1,55,799.

GUM MYRRH : From France : Gorgia Chemical Industries, 1,800 kgs., Rs. 57,592.

GUM ROSIN : From Italy : Vimala Dermatological Centre, 8,750 kgs., Rs. 55,025; From Indonesia : Universal Polymers, 10,000 kgs., Rs. 62,886; From U.K. : Universal Cables Ltd., 10,000 kgs., Rs. 62,886.

GUM ROSIN N GRADE : From U.S.A. : Moradabad Art Industries, 36,000 kgs., Rs. 2,75,023; From K.S.A. : P.P. Metal Corporation, 9.000 Mts., Rs. 65,662; From Italy: H & R Johnson (I) Ltd., 10,000 kgs., Rs. 62,886; From Japan: Goodluck Plastic Industries, 17,100 kgs., Rs. 1,07,536; Ficom Organics Ltd., 49.95 kgs., Rs. 3,19,435.

GUM ROSIN 'WG' GRADE : From Iraq: Mahavir Traders, 105 Mts., Rs. 6,88,105.

GUM ROSIN "WW" GRADE: From Germany : Orwo Ltd., 99.90 Mts., Rs. 7,02,172; From F.R.G. : NIBS India, 17,480 kgs., Rs. 1,13,396; Elecon Engineering Co. Ltd., 17,480 kgs., Rs. 1,13,396; From Korea: Jalan Woollen Industries, 17,480 kgs., Rs. 1,13,396; From Iran: Sat Karton Trading Agencies; 17,480 kgs., Rs. 1,13,396; From F.R.G. : Deltamike Enterprises, 17,480 kgs., Rs. 1,13,396.

GUM ROSIN N GRADE : From Japan: Themis Agencies, 79.875 Mts., Rs. 4,85,135.

HEXANE DIOL: From Japan: Plato Trades, 400 kgs., Rs. 23,947.

HEXYL SALICYLATE: From Japan : HMT Bearing Ltd., 600 kgs., Rs. 45,065.

HYDRAZINE HYDRATE : From Germany: Goel, 16,000 kgs., Rs. 4,02,470.

HYDROSULPHITE CONCENTRATE: From France : Helios Food Additives P. Ltd., 5,000 kgs., Rs. 56,267; From Sweden : Flexoplast Abrasives (I) Ltd., 5,000 kgs., Rs. 56,267; From Australia: Bharat Heavy Electricals Ltd., 5,000 kgs., Rs. 54,612; From Germany: The paper Products Ltd., 10,000 kgs., Rs. 1,12,533.

HYPOQUINONE : From Taiwan : Prakash Plastic Industries, 4,000 kgs., Rs. 1,47,486.

HYDROXY ETHYL ACRYLATE : From U.S.A. : P.C. Jain Sons, 203 kgs., Rs. 11,941.

HYDROXYETHYL CELLULOSE : From G.D.R. : CZ Instruments India P. Ltd., 1,021 kgs., Rs. 3,65,500.

HYDROXYLAMINE SULPHATE : From China : Ballarpur Industries Ltd., 5,000 kgs., Rs. 1,36,320.

INSOLUBLE SULPHUR : From U.S.A. : Rallis India Ltd., 16,000 kgs., Rs. 4,79,844.

IODINE CRUDE : From Taiwan : Delhi Acrylic Mfg. Co. Ltd., 1,000 kgs., Rs. 2,40,953.

IODINE CRUDE 99% MINIMUM : From Japan : H.T. Bhavani Chemicals P. Ltd., 1,500 kgs., Rs. 3,50,507 ; From France ; Kirloskar Oil Engines Ltd., 3,600 kgs., Rs. 8,57,897.

IODINE CRUDE MINIMUM 99.5% : From France : Brooks Corpn., ,2000 kgs., Rs. 4,83,229.

ISOCYANATE : From USA : Ishwar Arts, 15.876 Mts., Rs. 4,84,387 ; From U.S.R. : Madhya Bharat Paper Ltd., 18,000 kgs., Rs. 4,63,326 ; From Korea : Ispl. Industries Ltd., 18,000 kgs., Rs. 4,63,326 ; From U.S.A. : Manohar Photo Offset, 4,000 kgs., Rs. 1,09,981.

ISOPHYTOL : From Germany : Grindwell Norton Ltd., 3,740 kgs., Rs. 7,29,157.

ISO PENTYL GLYCOL: From Germany : Asian Paints I. Ltd., 2,000 kgs., Rs. 45,688.

ISO PRENYL ALUMINIUM : From U.S.A. : Kirloskar Cumins Ltd., 3.200 Mts., Rs. 5,37,669.

ITACONIC ACID : From U.S.A. : P.C. Jain Sons, 50 kgs., Rs. 3,324.

L-DOPA BP : From U.S.A. : The St. Dad Maharashtra Electricals, 50 kgs., Rs. 74,470.

—L. LYSINE MONOHYDROCHLORIDE USP : From Australia : J.K. Industries Ltd., 2,500 kgs., Rs. 1,62,179.

L. LYSINE MONOHYDROCHLORIDE USP MINIMUM 99% : From U.K.K. : Himson Industrial Ceramic P. Ltd., 2,000 kgs., Rs. 1,21,006.

LABORATORY CHEMICALS : From Japan : Uttam Galva Steel Ltd., 1 Ltr., Rs. 4,257.

LACTOSE BP/IP : From Netherland : Kantilal Manilal & Co., 3,500 kgs., Rs. 40,349 ; 10,500 kgs., Rs. 1,21,047.

LECITHIN PRIME : From U.K.K. : Echjay Electronics P. Ltd., 1,820 kgs., Rs. 1,30,893.

LINALOL PURE : From Korea : Essen Per. P. Ltd., 100 kgs., Rs. 14,274 ; From Saudi Arabia : Rohit Pulp & Paper Mills Ltd., 35.500 kgs., Rs. 59,079.

LINALYL ACETATE : From Saudi Arabia : Rohit Pulp & Paper Mills Ltd., 33.500 kgs., Rs. 67,744.

LITHIUM BROMIDE ANHYDROUS : From Hong Kong : Malhotra Global Eximp. P. Ltd., 500 kgs., Rs. 1,05,949.

LITHIUM HYDROXIDE : From Finland: Newsprint Trading & Sales Corporation, 1 kg., Rs. 56,360.

MALEIC ANHYDRIDE: From Italy : Dujodwala Resins & Terpenes P. Ltd., 17,500 kgs., Rs. 2,31,686 ; From Australia : Punjab Woolcombers Ltd., 11,400 kgs., Rs. 1,75,074 ; From Germany : Hindustan Ciba Geigy Ltd., 34,000 kgs., Rs. 4,00,617.

MANNITOL (BP) USP PYROGEN FREE : From Rome : Sudarshan Traders, 1,000 kgs., Rs. 21,183 ; From Hong Kong : International Book House P. Ltd., 1,000 kgs., Rs. 21,183; Rani & Co., 1,000 kgs., Rs. 21,183.

2-MERCAPTO ETHANOL : From U.S.A. : Oil & Natural Gas Commission, Officer-in-charge, 200 kgs., Rs, 11,815.

METHANE SULPHONYL CHLORIDE : From Brazil: Tata Exports Ltd., 544.32 kgs., Rs. 27,008.

METHIONINE HYDROXY ANALOG : From Pakistan : Hemkumar Jugardas Mody, 1,000 kgs., Rs. 31,774.

METHYL CHLORO FORMATE : From Switzerland : Resident Representative, 5,000 kgs., Rs. 95,983.

METHYL DICHLORO ACETATE : From U.S.R. : Gyanchand & Sons, 1,000 kgs., Rs. 35,668 ; From U.S.A. : Apuraj Chemicals P. Ltd., 1,000 kgs., Rs. 35,668.

METHYL ETHYL KETONE : From Belgium : Premier Grinders and Packers P. Ltd., 13,600 kgs., Rs. 1,65,688.

METHYL NADIC ANHYDRIDE : From Iran : Kochar Trading Co., 1,760 kgs., Rs. 1,00,194.

METHYL PYRAZOLIC ACID: From Japan : Indmag P. Ltd., 464.4 kgs., Rs. 89,958.

MICRO CRYSTALLINE CELLULOSE : From Belgium : Anshul Chemicals P. Ltd., 750 kgs., Rs. 54,122.

MINERAL OIL ADDITIVES: From Japan : Raj Trading Co., 1,900 kgs., Rs. 62,270.

MOLYBDENUM TRIOXIDE (REFINED) : From Italy : Technofab Engineers P. Ltd., 500 kgs., Rs. 46,337.

MOLYBDIC OXIDE HIGH GRADE : From U.S.A. : Asian Paints India Ltd., 10 kgs., Rs. 5,43,275.

MONO OCTYL TIN OXIDE : From Iran : Dolatram Tikamdas, 2,000 kgs., Rs. 3,51,325.

MONO ETHYLENE GLYCOL (FIBRE GRADE): From K.S.A.: Century Enka Ltd., 996.897 Mts., Rs. 48,75,340.

MONOTHANE : From Japan: Larsen & Toubro Ltd., 3,000 kgs., Rs. 1,47,737.

MORPHOLINE : From Germany : Bharat Heavy Electricals Ltd., 30.040 Mts., Rs. 7,19,845.

OCTAMETHYL CYCLO TETRA SILOXANE : From Qatar: Indian Petro Chemicals Corpn. Ltd., 7,800 kgs., Rs. 2,78,491.

OCTOIC ACID : From Singapore : Current Technical Literature, 10,070 kgs., Rs. 1,66,580 ; From Germany : Indian Oil Corporation Ltd., 10,070 kgs., Rs. 1,66,580.

OCTOIC ACID : From Belgium : Oil and Natural Gas Commission, 14.820 Mts., Rs. 2,45,156.

OLEYL CETYL ALCOHOL : From Germany : Tata Engineering & Locomotive, 3,400 kgs., Rs. 85,704.

ORTHO CHLORO PARA NITROANILINE TECHNICAL PURE DRY GRADE : From Korea : M.K. Auto Industries, 5,000 kgs., Rs. 4,33,249 ; From Finland : Pragati Paper Mills P. Ltd., 3,000 kgs., Rs. 2,49,248.

PANTOHENOL : From Thailand : Nav Maharashtra Chakan Oil Mills, 200 kgs., Rs. 64,952.

PARA CRESIDINE : From Korea : The Bhoir Industries Ltd., 2,520 kgs., Rs. 3,50,308 ; From Japan : Bharat Heavy Electricals Ltd., 1,000 kgs., Rs. 1,30,975.

PARA CRESIDINE (PURITY 99% MINIMUM): From U.K.K.: Hindustan Leaver Ltd., 2,450 kgs., Rs. 3,40,577.

PARA FORMALDEHYDE : From U.S.A. : Kec International Ltd., 17.500 Mts., Rs. 99,515.

PARA HYDRXY PHENYL ACETAMIDE : From Japan : Lubra Diz Tube Engineers Ltd., 300 kgs., Rs. 1,90,556.

PARA HYDROXY PROPIOPHENONE : From China : Saurashtra Paper & Board Mills, 200 kgs., Rs. 65,564.

PAS SODIUM BP WHITE CRYSTAL : From BAR. : Merchandise Copco., 1,500 kgs., Rs. 1,58,870.

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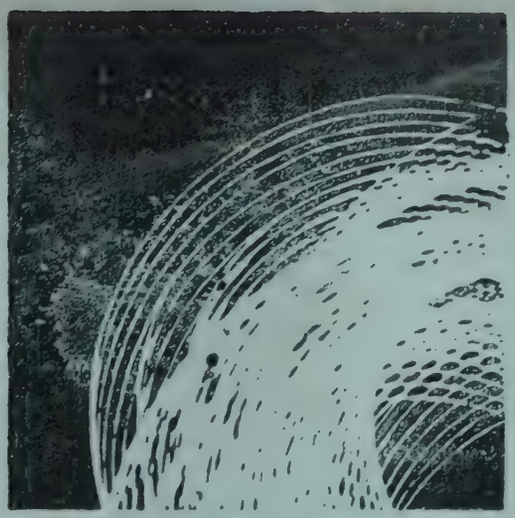
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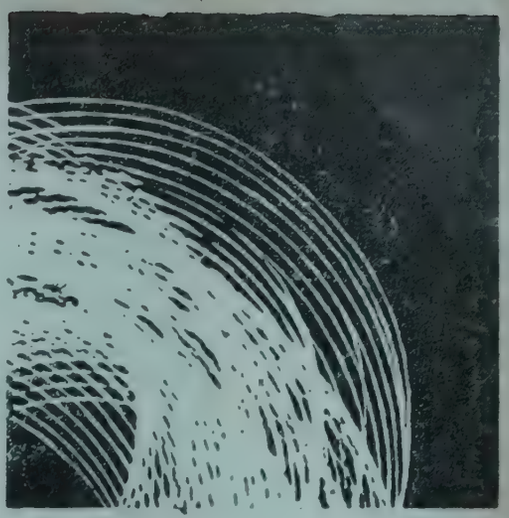
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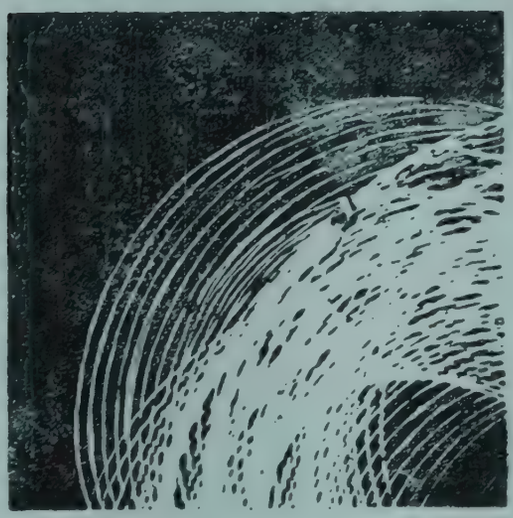
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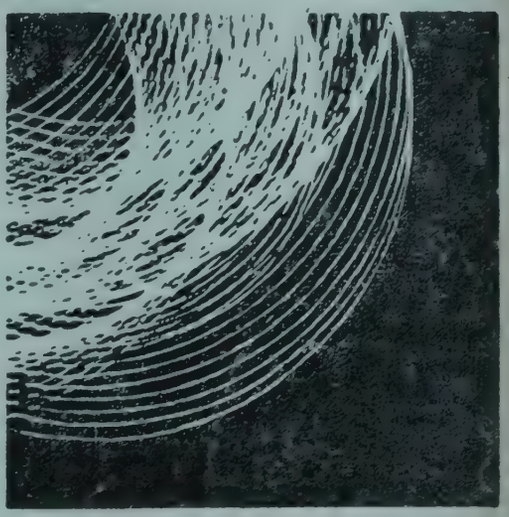
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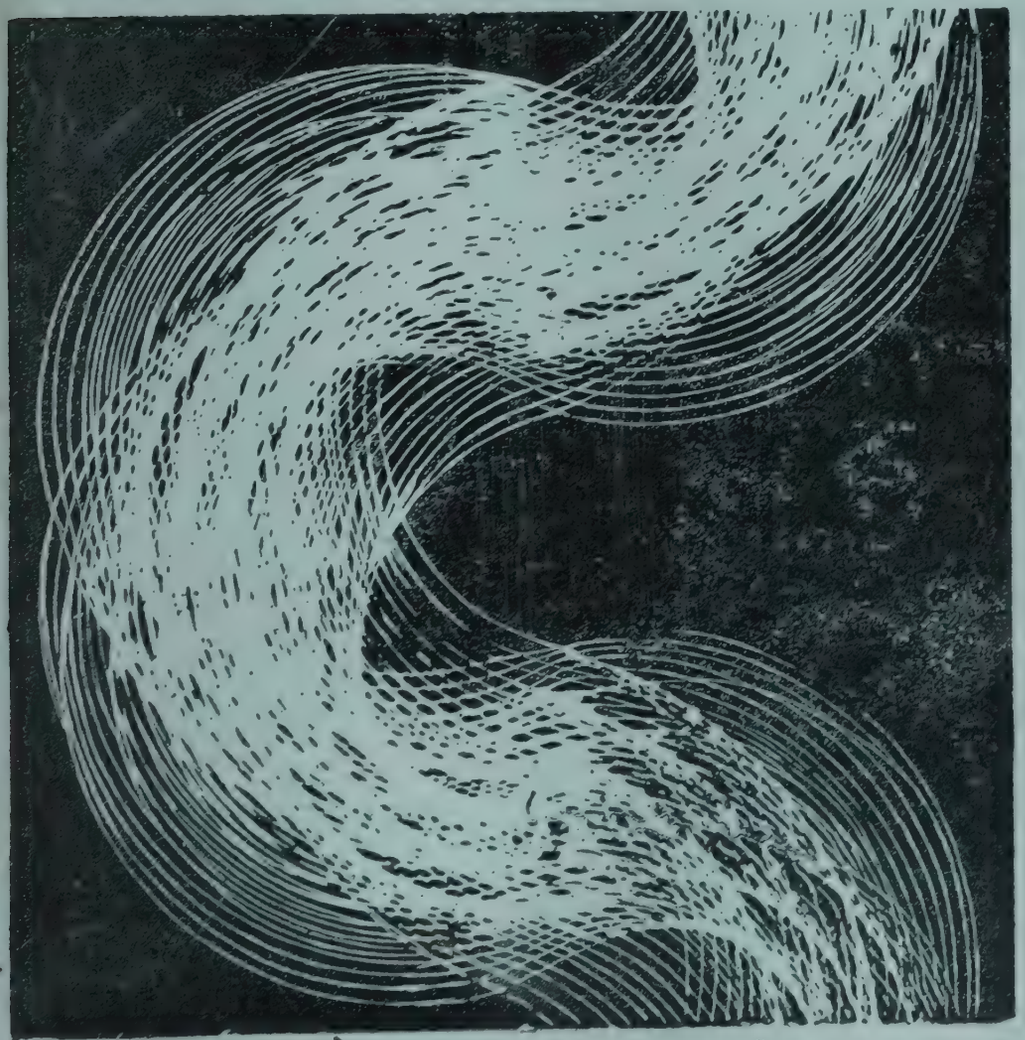








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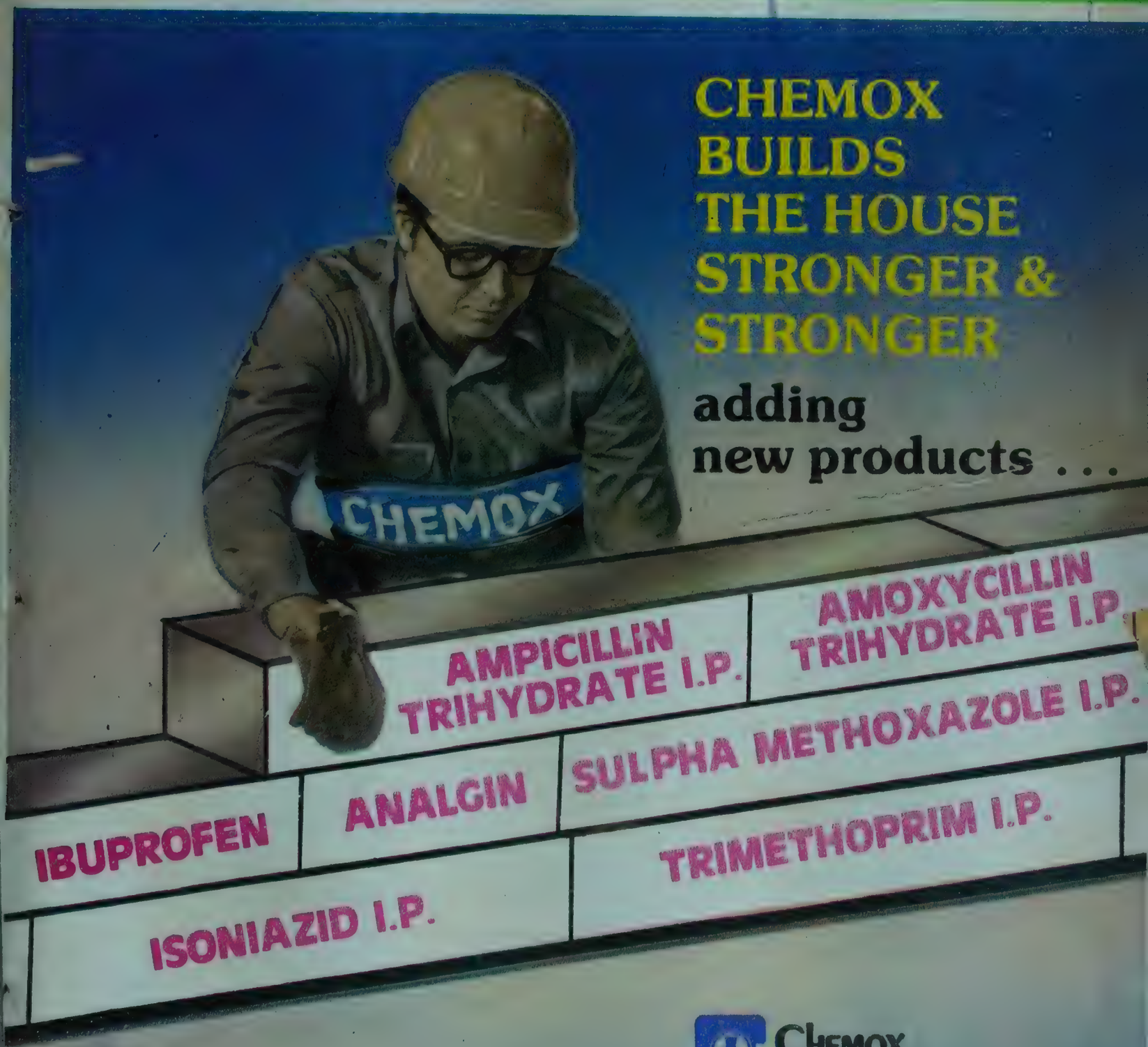
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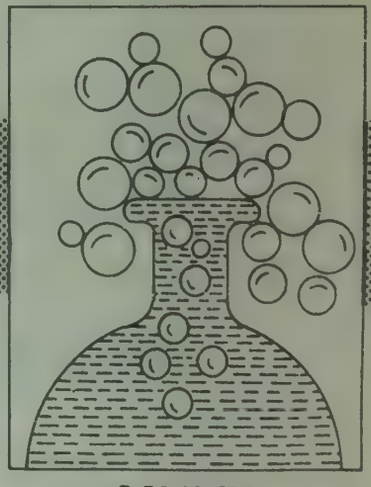


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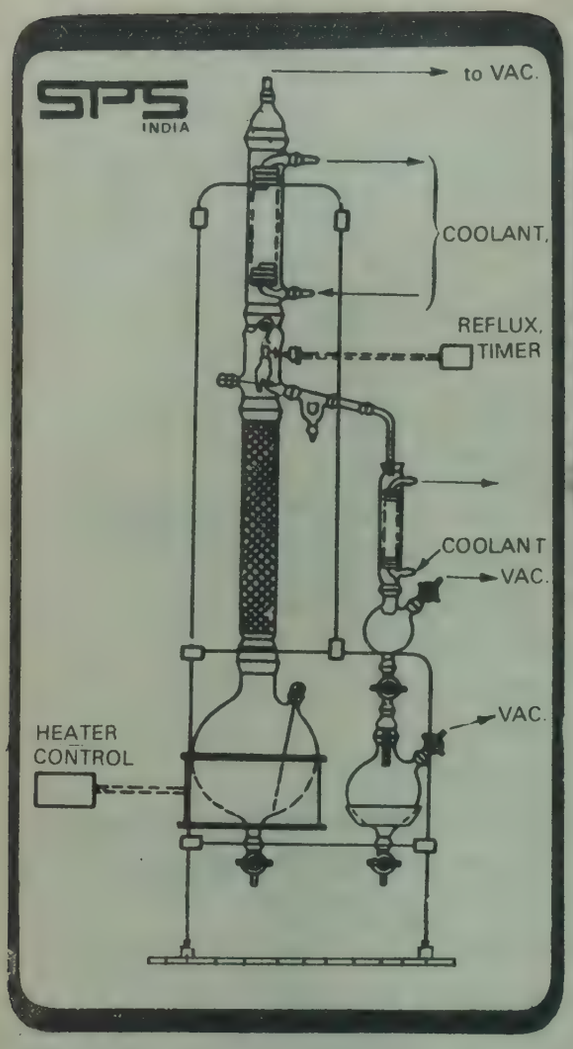
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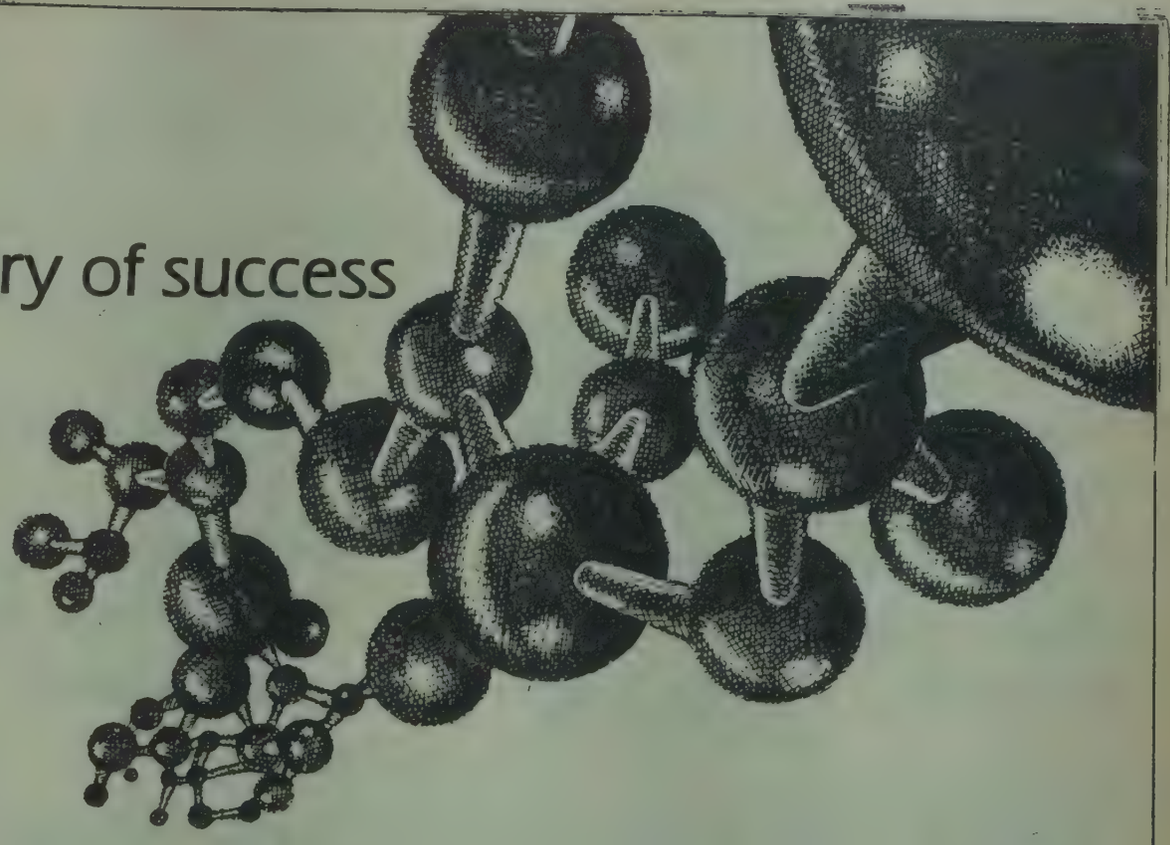
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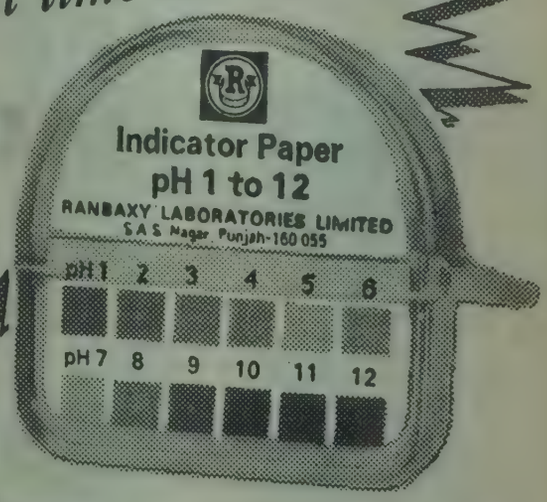
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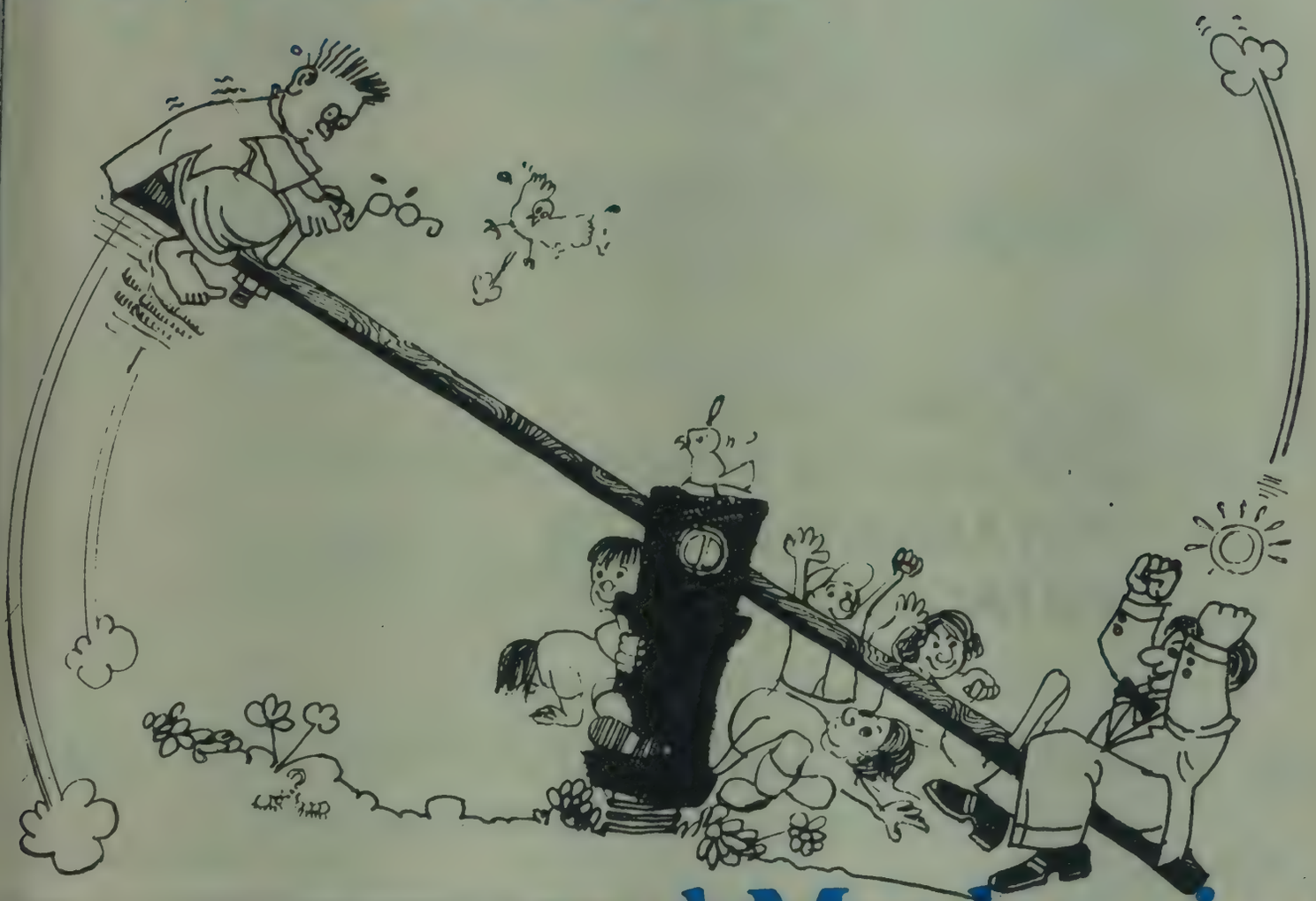
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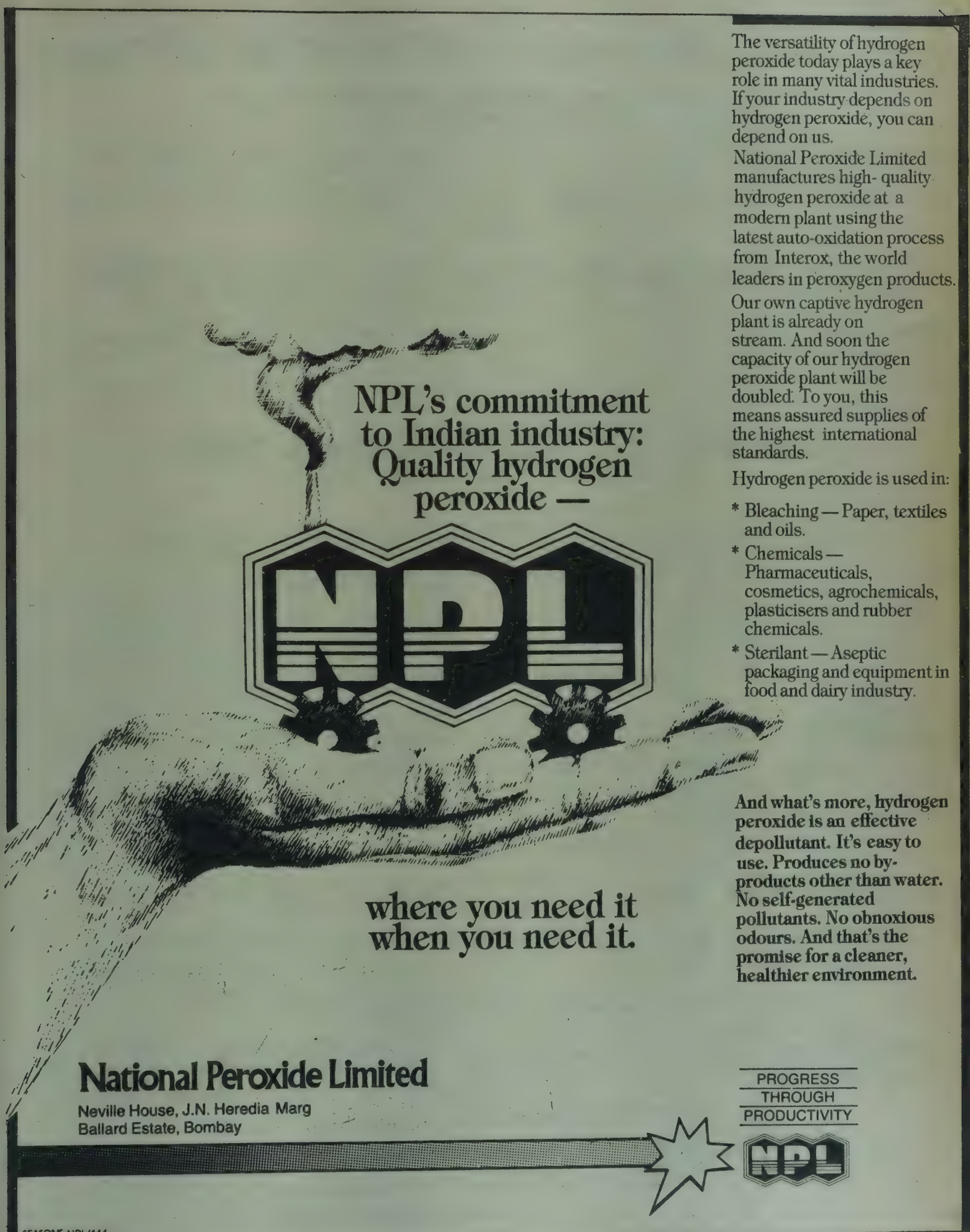
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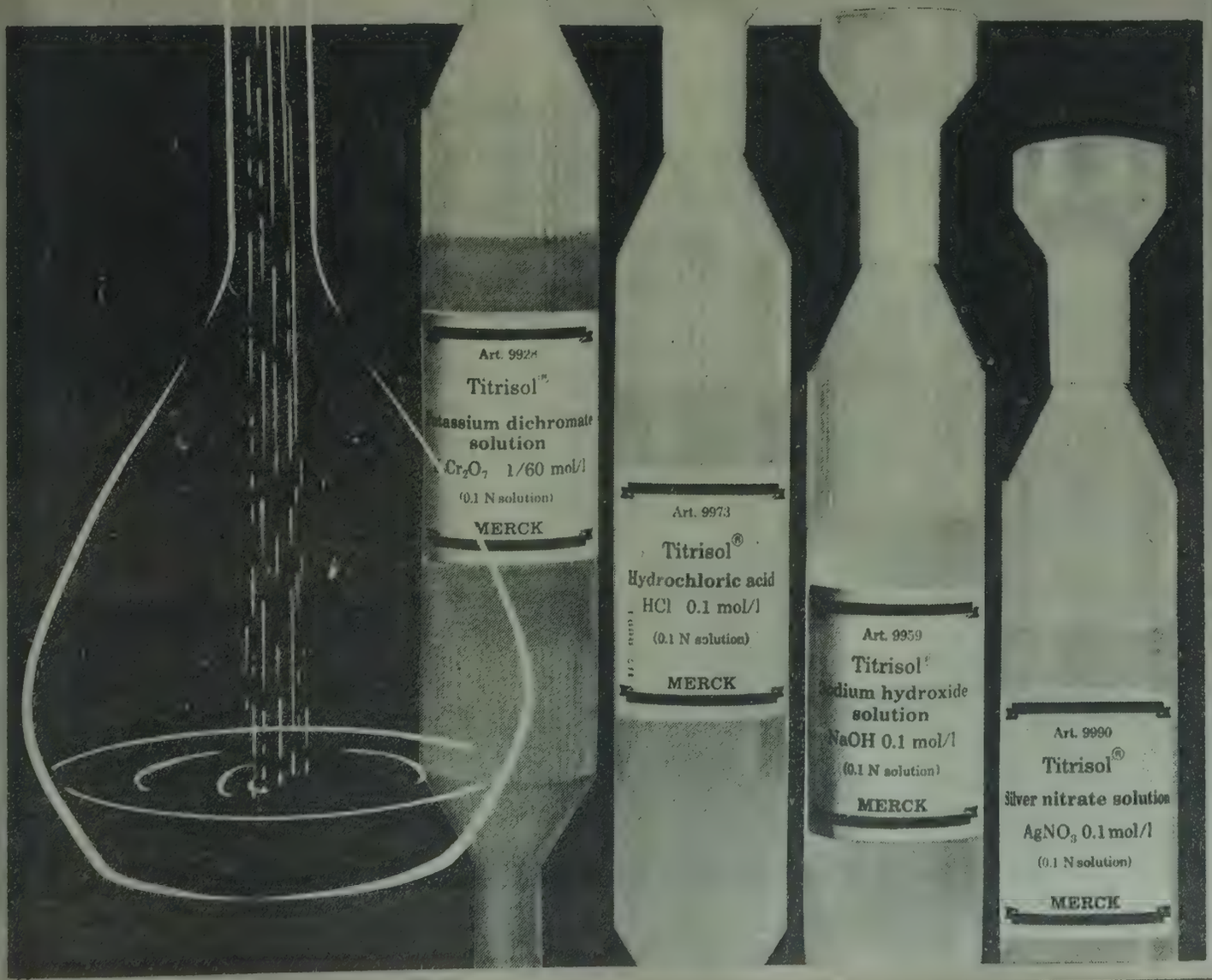
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CHEMICAL WEEKLY

VOL. XXXIII APRIL 26, 1988 NO. 33

Hydrogen as a Fuel — "Environmentalists Dream and Engineer's Nightmare"

In recent years the concept of hydrogen as a universal fuel and energy vector for the 21st century has been gaining ground. The International association for hydrogen energy was founded in 1974; its technical journal Hydrogen was launched in 1976 and World Hydrogen energy conferences are being held periodically. Far sighted people look upon hydrogen as a solution to the twin evils of resource depletion and ever increasing pollution of the environment arising from the combustion of fossil fuels. It is in this context that hydrogen is being looked upon as the ultimate clean, perennial non-polluting fuel of the future.

Hydrogen may be manufactured by the decomposition of water using as primary energy input, coal, nuclear or any of the renewable energy sources (solar, wave energy, geothermal or hydropower). When hydrogen undergoes combustion, the cycle is closed and the end product is water. The attraction of hydrogen for this role relies not only on its merits as a clean fuel but also in the fact tht it is easier and cheaper to store and transmit hydrogen over long distances than electricity.

The world energy picture even during the period of acute oil shock of the seventies did not present hydrogen in a favourable light. Of the total world hydrogen production of about 20 million tonnes, 98% is used in chemical manufacture — ammonia, methane — petrochemicals etc. Less than 2% was being supplied as free gas to the non-captive market. In a paper published in 1980, Dell estimates the credible new demand for H_2 at about 35 million tonnes/year. The figure looks formidable when we realise that 90% of the world's present hydrogen production stems from natural gas and oil and only 10% from solid fuels and electricity.

Hydroelectric power is favourable economically and environmentally but its scope is limited by geographic factors. Till Chernobyl, it was being confidently assumed that as oil and natural gas are phased out of use for electricity generation, their place will be taken by coal and nuclear energy. In principle, nuclear process heat at high temperature may be employed by means of an indirect thermochemical cycle involving a closed loop of chemical reactions, the overall net process being $2H_2O \dashrightarrow 2H_2 + O_2$. Many such reaction schemes have been studied, some with limited success in the laboratory. However, on a realistic production scale, such schemes appear to be doomed to failure because of their chemical engineering complexity, low overall efficiency and high costs. Moreover high temperature reactors are lagging behind in development and interfacing of chemical plant with the reactor poses many problems. It follows nuclear energy is likely to be transformed into hydrogen first by generating electricity and then electrolysing water.

With coal as the primary fuel, a clean choice is available for generating hydrogen via coal generated electricity or directly by reducing coal with steam (water gas reaction). These two are well established processes. The extent to which each route is followed will depend on the relative availability of raw material and cost of power. Even in Europe where coal is relatively expensive, it will be difficult for a dedicated nuclear plant using electrolysis route to compete on cost grounds with water gas route for hydrogen manufacture. It seems likely that electrolysers may come into their own as a means of surplus off peak nuclear generating capacity, whenever the nuclear component of a grid exceeds the base load. Electrolytic hydrogen can then be produced at marginal rather than full cost.

Since electrolytic hydrogen is necessarily more expensive than electricity from which it is produced and since electricity itself is a flexible, convenient and clean form of energy, it follows that hydrogen will be used only where electricity is unsuitable as an energy vector. Such uses for hydrogen are manufacture of chemicals (ammonia, methane), synthetic fuels, long distance transmission of energy since pipelines are cheaper than electrical transmission lines and possibly as a transport fuel. With regard to the manufacture of hydrogen, water gas processes are well established, commercial electrolysers in the range of 2.5 to 250 M^3/h are available readily. The world's largest electrolyser plant at Aswan

Dam has a design output of 3400 M3/hr equivalent to 2000—2500 Tonnes/year. By comparison an electrolyser coupled to a nuclear reactor would have a generating capacity of 240,000 M3/hr. requiring an electrolyser 70 times bigger than the one at Aswan Dam.

The theoretical voltage for water decomposition is 1.2 V but present day diaphragm cells operate at 1.9 to 2.1 V. This necessitates developing improved electrocatalysts and also pressurised cells capable of operating at temperatures around 200 V. Storage of large quantities of hydrogen is feasible in underground aquifers, salt caverns or exhausted natural gas fields. Liquid hydrogen is required in this form e.g. aerospace applications. Storage of hydrogen in solid form as a metallic hydride is possible only in small quantities. As of today, the principal potential applications lies in hydrogen powered vehicles. The only practical means of large scale transmission is by pipeline. This technology has been well developed in the Ruhr Works where the network exceeds 200 km. Low transmission cost of hydrogen coupled with environmental acceptability as compared to electricity has come to be proved beyond doubt. A liquid hydrogen fuelled aircraft would have increased range for a given mass of fuel or increased pay load for a given range. But the low volumetric energy density i.e. only one third of the hydrocarbon fuels is an adverse factor.

As for road transport a gas cylinder is too bulky and liquid hydrogen is too costly to be used for road transport. However, iron-titanium alloy hydrides which decompose reversibly at ambient temperature and magnesium alloy hydrides which can be used at elevated temperatures are being experimented with by the Daimler-Benz Company. The flammability limits of H_2 in air (4-75%) are much wider than those of petrol (1-6%). Thus the higher value for the lower limit is actually safer particularly when regard is paid to the speed at which hydrogen diffuses in air. The other hazardous features of hydrogen are its very low ignition energy (0.02 mJ), its high flame velocity and the tendency of hydrogen to embrittle some steels.

The theme of hydrogen economy used to be paraphrased successfully as "environmentalist's dream and engineers nightmare". The post Chernobyl anxieties and the threat of global green house effect visualised by the environmentalists has brought the theme of hydrogen fuel back in the limelight. West Germany is spending about $219 million/yr on renewable energies to clarify the key questions of hydrogen economy. France has an organised programme as part of its massive nuclear effort. Canada has just released a report that calls for making hydrogen a national mission. Japan is spending hundreds of millions of dollars on energy alternatives, including the design of advanced hydrogen powered car and truck engines and development of hydride-driven heat recovery and heat pumps.

The European Economic Community is sponsoring a German DECHEMA study to examine the concept of buying cheap Canadian hydrogenerated electricity, using it to split water and shipping the hydrogen either as a liquid hydrogen or via some other channel carrier to Europe for use as a fuel. Current estimates arrive at an energy cost of 11cents/Kwh. Average costs of 38cents/Nm^3 of hydrogen compare favourably with hydrogen production costs from photo voltaics (about $1.37/$Nm^3$) and solar thermal energy conversion (about 90cents/NmJ). These are about 66% more expensive than production from natural gas. However hydrogen is cheaper than aviation fuel.

West Germany considers hydrogen part of the broader strategy on renewables and energy conservation. The first step is to make solar energy less expensive, primarily through cheaper photo voltaics, with other solar technologies to follow. Then solar energy can be mated to hydrogen with the logical storage and transport media to follow. Aerospace — one of the companies under the Daimler Benz group, has been working on a project named "Hot Elly", a method to electrolyse steam rather than water at temperatures of 1000 Degree C and efficiencies of 94%. Part of "Hot Elly" attraction is that much of the energy needed to split the water molecule can be injected as raw heat avoiding a large portion of the conversion losses encountered in conventional electricity generator.

France is continuing its broad nuclear build up and wants for use that capacity to produce hydrogen at off peak periods. France envisages possible outlets by the turn of the century for electrolytic hydrogen as a fuel mixed with town's gas or natural gas to make synthesis gas and methanol, in the redirectors of iron ore and eventually as transportation and aviation fuels. In the immediate future, France is concentrating on liquid hydrogen for the space programme. India's liquid hydrogen project for its space programme is likely to take shape at Sahupuram (DCW Works). Construction of liquid hydrogen plants to make rocket fuel is making headway in Japan. Considerable work is being done on hydrides as statutory devices for hydrogen storage.

West Germany has taken on hand two projects, one a $27 million solar/hydrogen study and demonstration facility in Bavaria ad a similar German Saudi Arabian enterprise with experimental facilities in both countries. Another project planned by a consortium of German companies includes a 300 KW of electrolytic capacity to produce hydrogen and with a second project for a 100 km solar/hydrogen project at a Saudi Arabian city. The current trends engender enough optimism to predict a significant role for hydrogen as a fuel in the energy pattern of the first decade of the 21st century.

There is a report of a latest invention of a mixture of plant chlorophyll and platinum that enables sunlight to split water into its constituents H_2 fuel and O_2. If this materialises, this will release unlimited quantities of H_2.

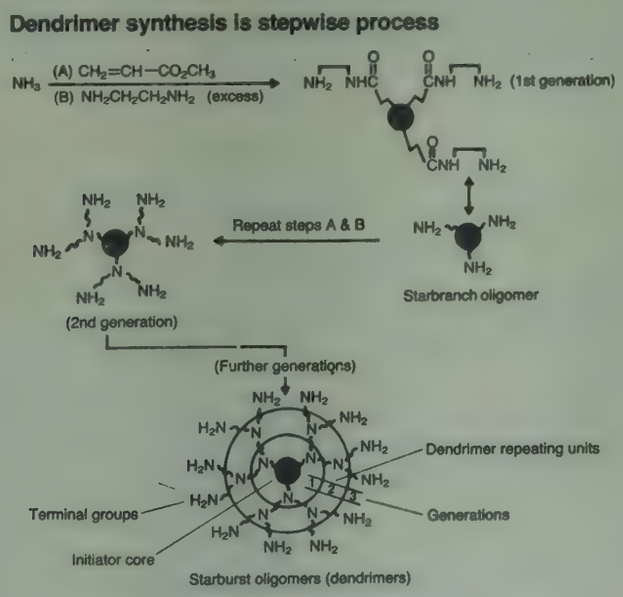
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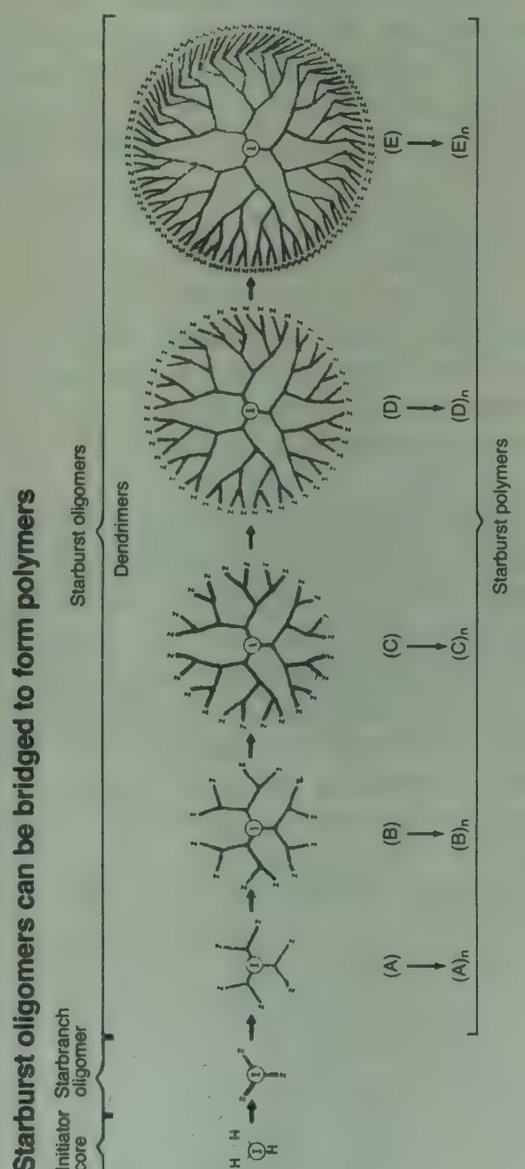
S.L. VENKITESWARAN

New Macromolecules

A totally new type of polymers or macromolecules have been synthesised by researchers at Dow Chemicals. These have precise molecular weights instead of the ranges of polymers like polyolefins, PVC etc. They are synthesised with branching strategies with precisely controlled size, shape and molecular weight and are termed "Starburst Dendrimers". They have three features, an initiator core, interior layers of repeating units radially attached to the core and an outer surface of terminal functionality all built up step-wise. Several classes are possible but the polyamidoamines PAMAMs are typical. Based on ethylene diamine and methyl acrylate through Michael addition to form a triester. After that this is further amidated with EDA to form a triamidoamine -- a "starbranch oligomer". These steps are repeated to form further branching dendrimers with twice as many terminal groups as the predecessor. With ammonia as initiator core the progressive numbers are 3,6,12 and upto 1056 for 10th generation. The molecules tend to assume a spheroidal shape. When EDA is used the progression is 4,8,16 and so on. Large excess of EDA is used to hinder the dendrimers from bridging and all excess EDA has to be removed before the next step. After a few series there is no room for further build up. The type of reaction and molecules which are formed are illustrated in Fig. A.



Other such molecules -- polyethylene imines from m miristyl aziridine have been made. In a similar way scientists of University of Arizona have synthesised startburst polyethers using pentaerythritol through a more complex sequence. Another group of Louisiana State University have investigated compounds termed "arboreals" from alkyl halide and triethyl methane tricarboxy-



late and then amidation using tris(1) hydroxyl methyl aminomethane.

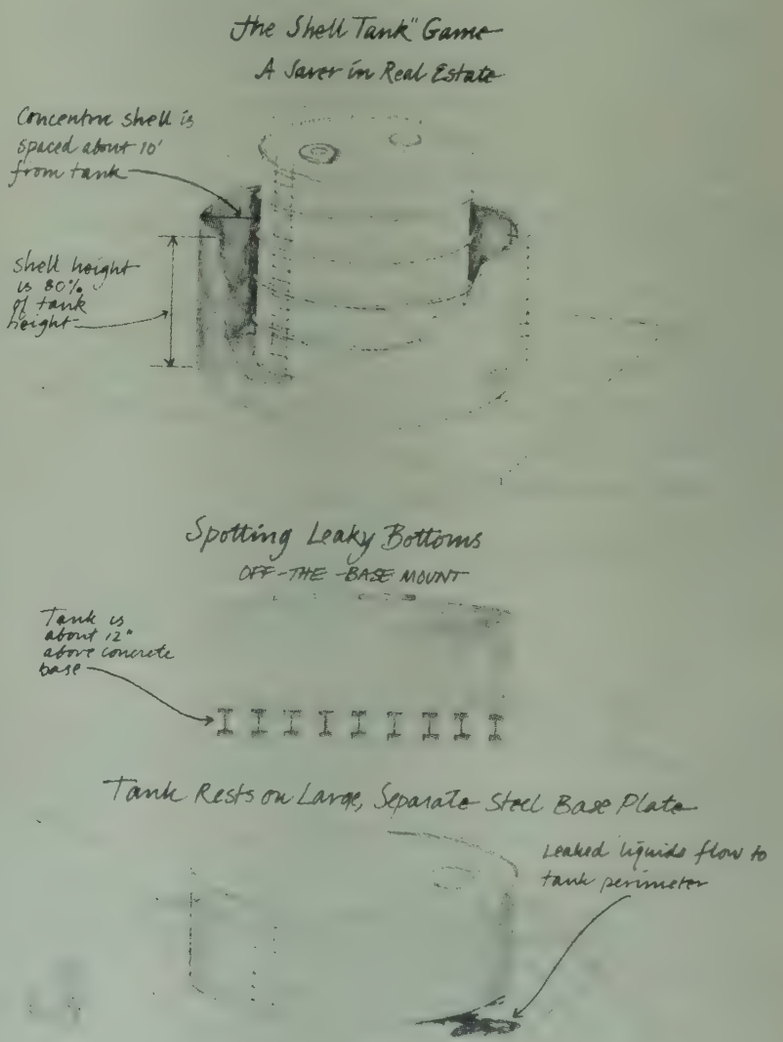
These starburst dendrimers and arboreals are novel compounds though their usage is difficult to visualise. The outer surface has many hydrophilic groups while the interior is an hydrophobic core. The terminal amino groups can be replaced with hydroxyl or carboxylates by suitable reactants. What is expected is that some of these may find use as solubilising or gelatinising agents and for controlled and targetted delivery of drugs or agrochemicals. They could find use as adhesives or adsorbents. The diameters can be controlled between a range of 10 to 500 Angstroms. But the uses of such compounds which are so different from chain polymers that are in extensive uses now are rather uncertain but it is hoped that these molecules will not remain mere curiosities. *(CE News, Feb. 1988)*

Storage Tanks

With ever increasing concern on the impact of chemical industry on the environment, some attention is getting focussed on the large storage tanks for liquid chemicals. Far more important are the "tank farms" for petroleum products. A recent accident on Jan. 2, with the collapse of an oil storage tank of Ashland Oil near Pittsburgh has generated a lot of public interest in these visible symbols of potential catastrophe. The storage tanks and their installation are regulated by the concerned agencies -- particularly for oil products but perhaps not so much for chemicals, particularly for underground tankage. Following the storage dumps and the effects of leakages of harmful chemicals in landfills stricter regulations on underground storage of chemicals are being imposed in USA.

It is estimated that in U.S.A. out of 9.4 million underground storage tanks only 4% are for chemicals. There are however millions of tanks for oil for most large buildings and these are hardly monitored for corrosion or leaks. New regulations may require double-walled tanks for secondary containment and also leakage monitoring devices, adding greatly to costs. The above ground installations have now to have 100% of storage capacity enclosed by a concrete base and side walls for each group of not more than three tanks. In the case of underground tanks the material must be corrosion resistant and have double walls or liners. A lot of design effort is being devoted to the storage section of large chemical plants and some companies prefer to go for only above ground installations. The main changes are to have concrete shells up to 80% height for each tank spaced about 10ft apart and able to hold full content. Also suitable bottom supports beams with access to detect leaks. Fig. 3 is an illustration of this type of installation

In India we have not had any serious tank collapse or burst but fires in tank areas have been all too frequent. The oleum leak from a tank at DCM's factory in Delhi has set a precedent for damage claims. Leakage and collapse of road tankers have also been far too many for comfort. While the aurhorities will no doubt toughen the regulations, slackness in enforcement is often the major defect. *(Chem. Business, Feb. 1988)*



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Study foresees acetaldehyde shortage

A market survey has forecast a shortage of acetaldehyde in the coming years which may adversely affect production of glyoxl pentaerythritol and bulk drugs.

The bulk of the estimated 1,33,000 tonnes of acetaldehyde production goes for captive consumption in the manufacture of acetic acid, acetic anhydride, butanol, vinyl acetate monomer, esters and the like.

In the case of acetic acid too, the survey projects a demand of around 1,60,000 tpa by 1990, allowing for ten per cent growth of each consuming sector plus new consumers like PTA. The present installed capacity is about 1,30,000 tonnes. If the gap is not plugged, it may adversely affect consuming industries particularly esters, dyestuffs, pharmaceuticals and rubber latex.

The PTA plant of Reliance Industries has emerged the single largest consumer of acetic acid, with an annual requirement of around 10,000 tonnes. Two more PTA plants are on the drawing board stage. Another major consumer is likely to be Parekh Dyechem, with a licensed capacity to produce 10,000 tonnes of vinyl acetate monomer (VAM).

The current installed capacity of acetic acid is around 1,30,000 tonnes. This added to 68,000 tpa of fresh licences, will make up a total of 1,98,000 tonnes. Of this, 65,000 tonnes is based on methanol, leaving behind alcohol-based capacity at 1,33,000 tonnes.

It is pointed out that methanol-based plants will take at least five years to come up. BP Chemicals of the UK, who control the methanol technology, is yet to identify its partner, though according to industry sources, Gujarat Narmada Fertilisers (GNFC) is the most likely candidate if the former agrees to share the knowhow.

Meanwhile, the authorities appear to be having second thoughts on allowing the introduction of methanol route to acetic acid. This has been prompted by a number of factors like the cost of the new technology, the high cost of methanol vis-a-vis alcohol, the impact on the existing alcohol-based industry and the swelling reserves of alcohol in the country.

At present, acetic acid is produced from acetaldehyde through the alcohol route. Elsewhere it is manufactured from methanol. Grant of letters of intent to GNFC and Rama Petrochemicals for introducing the methanol route has stirred up the chemical industry.

Advocates of the methanol route say that the country would profit by the acquisition of the new technology. The alcohol lobby defends the traditional route as cost-effective and best suited for India, world's largest producer of molasses alcohol, whose surplus has prompted Government to export this commodity.

All studies point to increased dependence on crude and petroleum products in the coming years. The domestic production will not be sufficient to provide feedstock for the upcoming petrochemical complexes, according to Mr. S. L. Khosla, Chairman of Indian Oil Corporation.

Recognising the importance of alcohol as a chemical feedstock, the Government has provided incentives for its growth in the Seventh Plan. Maharashtra and Uttar Pradesh, the main alcohol-producing States, held a surplus of 140 million litres last year. The country produced 8.5 million of sugarcane in 1987 and it is expected to rise to 9.5 million tonnes during the current year. The 1989 crop has been estimated at 10 million tonnes.

The price of alcohol has been reduced from Rs. 3 per litre to Rs. 2.50 in UP and Rs. 2.80 in Maharashtra and the duty reduced from 71 P to 25 P. Also, the Government has adopted a policy of encouraging use of molasses alcohol for industrial use by diverting the potable liquor sector to other sources of supply.

The cost factor also seems to favour the existing route for acetic acid production. Apart from the high price of methanol (quoted around Rs. 4,500 a tonne at present), the average alcohol-based plant with a capacity of around 5,000 tonnes cost around Rs. 4 crores to Rs. 5 crores investment.

Methanol-based plant of 50,000 tpa (below which it is not available) costs about Rs. 80 crores. Two such units are enough to kill 20 odd alcohol-based units scattered all over the country. More than 80 per cent of industrial alcohol today goes into the production of acetic acid.

CD FOUNDATION AWARD ANNOUNCED

Dr. B. N. Bandopadhyay and his team from the Bombay Textile Research Association, (BTRA) have bagged the C.D. Foundation Trust Award of Rs. 10,000/- for the development of FR Finishes. M/s. Primatex Machinery Pvt. Ltd. Bombay and Prof. W. B. Achwal (of BUDCT) with his team won cash awards of Rs. 10,000/- plus Rs. 3000/- respectively. These awards were presented by Mr. D.S. Alva, President of Bombay Dyeing and Mfg. Co. Ltd. at a function held at Bombay on 15th April. Mr. Sushil Sen, a Textile Expert of the Commonwealth Secretariat, London, presided over the function. Prof. E. H. Daruwala, Chairman, Panel of Juries, announced the Award Winners. Earlier Mr. C. V. Somaiya, Partner, C.D. Corporation welcomed the Chief Guest and others. (Full report will appear in the next issue of CHEMICAL WEEKLY).

RCF CONSIDERING UREA PLANT TIE-UP WITH TIDCO

The Rashtriya Chemicals and Fertilisers (RCF), a government of India undertaking, would explore the possibilities of collaborating with the Tamil Nadu Industrial Development Corporation Tidco), for setting up urea plant in the state making use of the new gas finds in the Cauvery basin, according to the RCF's chairman and managing director, Mr Dulip Singh, reports PTI.

Mr Singh said the company also had plans to set up a drinking water purificatory plant in Tamil Nadu as the company had acquired the technical knowhow from the Baba Atomic Research Centre (BARC) for water purification through a specialised process. A pilot plant was functioning at Trombay in Maharashtra and since Tamil Nadu had shown interest in the field, they would be approaching the state government in this regard.

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Dr. O. P. KHARBANDA

Frankly Speaking

DR. O. P. KHARBANDA
Cost & Management Consultant
501, Olympus, Altamount Road, Bombay-400 026
(An author of repute and a visiting professor, Dr. Kharbanda consults worldwide including to UNIDO.)

The Role of Consultants

I find that consultants are a much misunderstood, maligned and misused group in the engineering profession. In writing on project management we have a section with the heading: 'Consultant or contractor(1)'? There we said that these days the line of demarcation between 'consultant' and 'contractor' was becoming more and more blurred. Nevertheless we believe that there is a difference and that this difference should be recognised. It may well be a controversial statement, but I would suggest that a consultant sells advice, whilst a contractor sells manhours, former's strength is brain and the latter's brawn - The contractor has a vested interest : he wants a project to go ahead, whereas the true consultant can take a completely impartial approach and may even advise abandoning that particular project. A consultant should not be employed in contracting since otherwise he cannot give impartial advice. Likewise, a contractor should not offer consulting services.

It is the promoter of a project that needs the assistance of a consultant, so if the consultant is not used effectively, then that is where the fault must lie. But first a consultant has to be selected. A lot has been written about this with dire warnings, articles on the subject carrying titles such as 'Why projects fail — the wrong way to choose a consultant'(2). It seems that when things go wrong it is the consultant that gets the blame ! However, there are also thoughtful articles on the subject, such as one by Mr. Frankenhuis(3). He is an independent consultant based in Paris who has worked for industry as well as for large consulting firms on four continents. He puts the blame where it belongs, saying :

> 'Management consultants are generally hired for the wrong reasons. Once hired, they are generally poorly employed and loosely supervised. The result is, more often than not, a final report that decorates an executive's bookshelf.'

But if the right course is followed, a more happy conclusion should be reached. The article by Mr. Frankenhuis goes on to set the prospective user on the right road by discussing in detail such topics as 'When to hire', 'Whom to hire', and 'How much to pay'. It is a great temptation to quote from his article at length, but I must restrain myself. The point is made that the greatest contribution that a consultant can make is his experience. He has seen the problem now being presented, or some variant, in other situations. He has devised solutions, or absorbed solutions implemented by previous clients. He is a living compendium of case studies. But the employer also has an important role to play. To quote once again: 'A consultant's effectiveness is closely related to the client's ability to express his needs, understand the results, and implement the recommendations.' So, we are back to square 1, the client !

That last point is crucial. Whilst the decision to use a consultant should be made with circumspection and with the conviction that sensible recommendations can be expected, there must also be a resolve to use and act upon the recommendations made, however unpalatable they may be. But remember that, unlike consumer goods, consulting services carry no warranty. They cannot ! The consultant is usually a 'specialist': experienced in one particular field, and there are a very large number of 'one man' firms. There is no secret made of the fact when you are dealing with a 'one man' firm, his fee may well seem very high, since you know that he is the sole beneficiary of that income. But do not forget that he will be fortunate indeed to work more than six months in the year. The rest of the time he is prospecting for work or educating himself about prospective work. And of course consulting firms, even a one-man show, has its overheads like any other business.

There are both national and international associations for consultants. Typical of the latter is FIDIC, the 'international federation of consulting engineers', with headquarters in Switzerland. The main objective of FIDIC is declared to be 'to enhance the stature and opportunities of the profession'. More to the point is the fact that those wishing to find a consultant can approach such bodies for a list of names of suitable individuals or firms. It will be found that the fees of consultants vary very little, and we do not think it wise to use competitive bidding when selecting a consultant. A consultant is rather like a doctor or a surgeon. The average patient does not go around comparing fees : all that he is concerned with is the degree of skill and expertise, and it is that, rather than cost, that should govern the choice of a consultant.

Indian consultants seem to do very well abroad. This is largely, I believe, due to the way in which they always show regard and concern for the interests of the owner. But there is a major lacuna. Most of the consultants are one-man **prima dona** type offering specialist advice in one particular field, and for this reason they do not stand much chance for consultancy assignments to international agencies. These agencies prefer consultants who can offer a wide variety of services under one roof. Perhaps the individual consultants need to 'pool' their resources.

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2. Simplicimus, J. T., 'Why projects fail — The wrong way to choose a consultant', **Worldwide Projects**, Dec. 1981/Jan. 1982, pp. 26-33.
3. Frankenhuis, P., 'How to get a good consultant', **Harvard Business Review**, Nov./Dec. 1977, pp. 133-9.

Pollution control : scheme for technical changes in refineries

The Union Government has decided to launch a massive programme to bring about necessary technological changes in the refineries in the country in order to drastically reduce the lead content in the motor spirit (petrol) to check pollution from the automotive vehicle exhaust.

According to informed sources, the Government plans to equip all the refineries in the country with necessary facilities for catalytic reforming or fluidised catalytic cracking units (FCCU) by September 1992 to bring down the lead level to 15 gms against the existing specifications of the Bureau of Indian Standards which permit a maximum of 0.56 gms of lead per litre of motor spirit.

Lead is added to petrol at the refineries for boosting the octane rating to improve its 'anti-knock' characteristic. It is added in the form of tetra ethyl lead (TEL). This has been the practice all over the world since the early thirties.

This lead in petrol has been found to be one of the pollutants from vehicle exhaust emissions. In deference to environmentalists agitations, several developed countries have not only revised specifications to reduce lead contents in petrol but have also introduced unleaded gasolines.

In India two grades of motor gasoline are marketed — 93 octane and 87 octane. Since the former (93ON) is available only in a limited number of towns, for all practical purposes it is 87 on petrol that is marketed throughout the country. This octane rating has been progressively increased from 79 to 83 and then 87 before the advent of the Maruti-Suzuki.

The Gujarat and Mathura Refineries of Indian Oil, because of their excellent FCCU operations, produce gasoline of as high as 90 to 92 octane rating. Other refineries with FCCU or catalytic reformers also produce gasoline requiring addition of negligible quantities of lead.

The Government's decision to reduce lead level in gasoline will call for not only putting additional reforming capacity but the operations of existing refineries will be required to be stretched to higher severities, according to Mr. S.L. Khosla, Chairman, Indian Oil Corporation.

Though there are a number of routes for meeting octane requirement like isomerisation, alkylation EC cost-effective option. In catalytic reforming also there have been two major shifts the world over. There has been change over from monometallic catalyst to bimetallic catalyst and semiregenerative process has given way to continuous catalytic reforming.

It is learnt that refineries in India also are beginning to adapt to the changing technology. Indian Oil's Haldia Refinery would switch over to bimetallic catalyst to augment gasoline yield with improved octane rating.

Both the US and Japan have leaded and unleaded gasolines marketed in their countries. In the US the premium grade leaded gasoline has a research octane number (RON) of 98 while the unleaded is 96 RON. The regular gasoline has 93 RON for the leaded variety and 92 RON for the unleaded variety. In both cases the leaded gasoline has about 0.22 gms of lead per litre. The unleaded gasoline has lead level of less than 0.01 gms per litre.

In Japan, the premium gasoline of 97 RON has about 0.17 gms. lead level per litre in the leaded gasoline and less than 0.004 in the non-leaded. In West Germany no non-leaded gasoline is marketed. Both the premium and regular gasoline (98 and 91 RON respectively) have a lead of 0.15 gms per litre.

SITE APPROVED FOR TATA FERT. PROJECT

The Union Government's Department of environment has approved the proposed site for the Tata fertilisers project at Babrala in Uttar Pradesh following recommendations of the environmental appraisal committee.

A company spokesman said that getting the environmental clearance for any industrial project is now the toughest and most time-consuming process which must nonetheless be welcome having regard to the invisible social costs of industry.

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More alcohol, molasses exports on cards

The Union Government is examining a proposal for authorising more exports of alcohol in a bid to take care of the glut situation that is likely to develop in the domestic market in the current alcohol year (December 1987-November 1988).

An alternative proposal for export of molasses with a similar objective of disposing of the huge stocks piling up with the sugar mills is also being examined by the Union Department of Chemicals and Petrochemicals, which is the administrative Ministry for alcohol and alcohol-based industries.

The proposal for export of either alcohol or molasses is being examined at the instance of the domestic alcohol industry as also the Indian Sugar Mills Association (ISMA). The alcohol industry, in particular, has pleaded with the Department for allowing it to export more in the current year.

Last alcohol year, the Union Government had allowed export of about 500 lakh litres with the same objective of tackling a domestic glut situation. Of the permitted 500 lakh litres of alcohol, 300 lakh litres were to be exported from Uttar Pradesh, 100 lakh litres from Maharashtra and 100 lakh litres from Tamil Nadu, all of which were surplus States.

According to information available with the Department, the alcohol industry has tied up exports of the entire authorised quantity and has even got the contracts registered with the State Trading Corporation. Shipment against these contracts are now taking place.

The decision on allowing exports of alcohol was taken last year as the actual demand came to be far lower than the actual availability. In the beginning of 1986-87 (December-November), the availability of alcohol was estimated at 6,943.91 lakh litres and the demand was assessed by the Central Molasses Board at 6,900 lakh litres.

But during the course of the year, it was felt that the actual utilisation was much lower than the availability of alcohol, as offtake of alcohol was poor. There were representations from both the alcohol distillers and the Indian Sugar Mills Association about closure of distilleries for want of lifting of alcohol and about overflowing of molasses in sugar factories.

With a view to easing this sutuation, the Government had allowed exports of alcohol, although in the preceding years the Government had been importing alcohol to meet a shortage situation. In fact, till November 1986, import of duty-free alcohol was permitted as part of the Government plan to make available this raw material for the chemical industries.

In the current alcohol year, the estimated production of alcohol is placed at 8,061 lakh litres, which together with the carry-over from the previous year raises the total availability at about 9,000 lakh litres. The estimated demand is placed at 8,164 lakh litres, of which 3,925 lakh litres is for potable purposes, 3,923 lakh litres for industrial purposes and 315 lakh litres for other uses.

Thus, a surplus of 834 lakh litres is estimated for 1987-88 alcohol year, which includes the 500 lakh litres already permitted to be exported. But if the last alcohol year's experience is any indication, the projected demand is always inflated and the actual demand is far lower than the projected demand, which leaves a substantial quantity of surplus alcohol at the end of the year.

For instance, the projected demand for alcohol in 1986-87 was 8,153 lakh litres, but the actual consumption came to only 5,676 lakh litres. As such, the actual demand in 1987-88 may also be substantially lower than the projected 8,154 lakh litres, thereby making available more surplus alcohol and creating a glut situation.

Also, an additional surplus of about 1,200 lakh litres of alcohol will be created as three major chemical companies would not be using any alcohol in the current year. The Chembur plant of Union Carbide is now closed and hence will not need any alcohol as its raw material. Indian Explosives Ltd.'s Rishra plant in West Bengal is also lying closed, while Synthetic Chemicals Ltd. (SCL) at Baroda has switched over to an alternative raw material (butadiene) for producing synthetic rubber. The annual requirement of alcohol for these three units was estimated at 1,200 lakh litres.

After taking these factors into account, the Department of Chemicals and Petrochemicals has assessed that the actual demand for alcohol in the current year would not be more than 7,000 lakh litres. It has thus seen reason in the proposal made by the alcohol distillers and sugar mills to allow exports of more alcohol or molasses.

There has also been no significant rise in demand for alcohol for chemical industries. This is because not many new chemical industries with alcohol as their basic raw materials has been set up in the last couple of years.

Even in the case of molasses, the estimated availability is projected at 39.56 lakh tonnes including a carry-over stock of 8.13 lakh tonnes. Of this, the proposed utilisation will be 35 lakh tonnes for distillation, 4.3 lakh tonnes for cattlefeed and 2.84 lakh tonnes for other uses. Although there may be a shortfall of 3.38 lakh tonnes, the Government is considering export of molasses as this will divert to the overseas market some quantity which otherwise would have contributed to the alcohol glut situation.

IPCL HIKES LDPE PRICE BY RS. 3,500

The Indian Petrochemicals Corporation Ltd., the sole producer of low density polyethylene (LDPE), has hiked the price of the materials by Rs. 3,500 a tonne.

LDPE goes mainly into the manufacture of canal linings (which aids irrigation and fights drought by preventing seepage of water) and milk pouches. Following the price hike, announced without consulting consuming industries, the price of milk pouches has spurted by Rs. 4 to Rs. 44 per kg, according to manufacturers, who are all in the small sector, some dairies have threatened to revert to reusable glass bottles.

Plastic processors allege that local manufacturers of plastic raw materials are taking advantage of the rising trend in international prices, thereby inhibiting the growth of this thrust sector. Processors recalled that Polyolefin Industries Ltd. (PIL), the sole manufacturer of HDPE, had increased its price only a few months ago.

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Import of 15 pesticides on OGL may allowed

The Union Government is reviewing its decision to allow import of 15 pesticides under open general licence (OGL). Inter-ministerial exercises have already begun to examine if curbs on import of these pesticides could be reimposed at least in those areas where adequate domestic capacity exists.

The exercises have been initiated at the instance of the Union Industry Ministry, which feels that the decision to allow OGL imports of these 15 pesticides could be harmful to the domestic industry, particularly in view of the concurrent decision taken by the Union Finance Ministry to reduce the import duty on these very items from 107 per cent to 70 per cent.

In effect, the domestic manufacturers of these pesticides have been exposed to competition from imports without the same degree of protection they used to enjoy through physical as well as fiscal restrictions. The Industry Ministry, which is the administrative ministry for pesticides manufacturers, has taken up the matter with both the Commerce Ministry and the Finance Ministry.

An informal group of officials in these ministeries is now engaged in this exercise to find an acceptable solution of the problem that might be created due to easy imports of pesticides. The Industry Ministry's concern and its promptness to take up this issue with other ministries concerned are based on the impact report of the fiscal and import policy changes received from the pesticides industry.

According to this report, several agro-industries corporations have planned for massive imports of pesticides particularly of butachlor and monocrotophos. Since all these pesticides are on OGL, it is difficult even for any official agency to monitor the ports.

If past experience is any guide, the facility of OGL imports has often led to flooding of the items concerned in the domestic market even before any corrective measure could be adopted by the Government.

The Department of Chemicals and Petrochemicals in the Industry Ministry has definite information that several agro-industries corporations have already opened letters of credit for importing pesticides. Pesticides manufacturers now want that corrective measures should be taken immediately, as even if some curbs are imposed now, imports against the letters of credit already opened cannot be stopped.

The 15 pesticides, put under OGL imports and also given the benefit of reduced import duties, are BHC, malathion, endosulfan, isoproturon, monocrotophos, methyl parathion, dimethoate, dhorate, zineb, thiram, 2-4-D, maneb, dithane, benthiocarb and butachlor.

The Government decision to put them under OGL was prompted by its view that domestically manufactured pesticides are priced substantially higher than those produced by foreign firms. The Bureau of Industrial Costs and Prices (BICP) had also opined that pesticide prices in the country were unreasonably higher than the imported ones.

Thus it was felt that domestic producers of pesticides should be exposed to some competition from imports so that they are compelled to reduce their production cost and selling prices. Subsequently, the Union Budget reduced the import duties on them and soon after they were placed under OGL imports.

The other rationale for such a decision was to give a boost to agricultural production by making available pesticides cheaper in the domestic market and thus providing greater plant protection against pests. Proper and more extensive use of pesticides made possible through their easy availability at reasonable prices, was also seen as a required input for achieving higher grains output in the coming years.

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Fungus source for drug found

Scientists at the Vector Control Research Centre (VCRC) in Pondicherry have discovered a rare fungus of immense commercial value because it is the source of a life-saving drug in great demand.

The discovery, which has caused great excitement in medical and pharmaceutical circles, has given a chance for Indian drug firms to enter the world market for the first time in a big way.

One of some 20 institutes under the Indian Council of Medical Research (ICMR), VCRC is engaged in biological control of mosquitoes.

The director of VCRC, Dr. P. K. Rajagopalan said his scientists stumbled upon the fungus "tolypocladium cylindrosporum" while routinely screening soil organisms for mosquito control agents.

This fungus produces "cyclosporin", a drug-of-choice used by doctors world over for saving patients undergoing organ transplants. The drug prevents organ rejection by selectively suppressing the body's immune system.

The drug is so expensive that for one single transplant operation, the cost involved on this drug is about Rs. 50,000.

According to VCRC, the entire world demand for cyclosporin was currently met by one multinational company which happened to possess the fungus.

With the isolation of the fungus by VCRC, India is now poised to break this monopoly.

Dr. Rajagopalan said the VCRC fungal strain was being kept under lock and key until ICMR decided about handing it over to a suitable Indian company for commercial exploitation.

"We found the fungus in the soil humus," VCRC microbiologist Dr. K. Balaraman, said. "It is not only capable of killing mosquito larvae, but produces a secondary metabolite that turned out to be cyclosporin", he said.

He said the identity of cyclosporin produced by the VCRC isolate had been confirmed by various assays by comparing it with the commercially available product.

Animal studies to determine the efficacy of the VCRC product will soon be carried out in a laboratory, he said.

At VCRC, the fungus is presently grown in a 10-litre fermenter. But the ICMR has granted Rs. 2.7 million for scaling up the production 10 times, Dr. Rajagopalan said.

RECORD OUTPUT AT TALCHER FERTILISER UNIT

The coal-based Talcher Fertiliser Plant, a unit of the Fertiliser Corporation of India, has made an all-time record production of urea and ammonia during the financial year 1987-88.

A plant press release issued in Cuttack on April 9, said the plant had produced 1,85,337 m.t. of urea and a record quantity of 1,16,092 mt of ammonia during the year against 1,27,868 mt and 79,331 mt respectively during the previous year.

The plant had despatched 1,88,301 mt. of urea to Orissa, Madhya Pradesh, West Bengal and Bihar, the release said and claimed that despite power constraints the plant had achieved the record production during the year.

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Non-iodised salt sale banned

The Union Health Ministry has asked defaulting States and the Union Territories to issue notification banning the sale of non-iodised salt on a priority basis.

They include Haryana, Tripura, Madhya Pradesh, West Bengal, Bihar and Delhi.

This is with a view to achieving the goal of universal iodisation of salt by 1992, which is part of the national goitre control programme. It envisages legal ban of the sale of salt other than iodised salt under the Prevention of Food Adulteration Act.

Nearly 40 million persons are estimated to be suffering from goitre in the country and fortification of salt is one of the ways of meeting the iodine deficiency which causes goitre.

There is a quantum jump in the production of iodised salt since the liberalisation of the policy of manufacture by private agencies and the announcement of subsidy from 1986.

Official sources assert that salt iodisation is totally safe to eradicate nutritional iodine deficiency. The decision to use potassium iodate rather than potassium iodide (as in Western countries) was taken because it is suitable to India. The available data shows that iodine content of even iodine sufficient food in India is not more than an average of 100 micrograms per day as compared to 500 micrograms or more in the US and Japan. The high intake in these countries has been found to be totally harmless.

In India, the standard prescribed is 30 parts per million (300 micrograms) of iodine at the manufacture level and not less than 15 parts per million in the distribution chanel.

The Union Government is according high priority to the fortification of salt and has allocated Rs. 21 crores in the Seventh Plan for this purpose. It is also included in the new 20-piont programme announced in 1986. This seeks to iodise about 52 lakh tonnes of salt by 1992.

The Salt Commissioner has been issuing permission to set up iodisation units to meet the growing demand for iodised salt. A total of 228 units have been allowed to produce iodised salt. In order to minimise the cost difference between iodised and non-iodised salt at the production centres, the cost of potassium iodate estimated at Rs. 7.20 per tonne of iodised salt is reimbursed on all despatches after August 1, 1986.

Official sources said all states and Union Territories may also be requested to find out the extent of iodine deficiency disorders in all the districts where such surveys have not been conducted so far.

Jammu and Kashmir, Punjab, Haryana, Himachal Pradesh, Assam, Goa Karnataka, Rajasthan, Orissa, Tripura, Delhi and Chandigarh have been requested to set up special cells for effective implementation of the goitre control programme, the sources said.

9 DRUGS FOUND TO BE BELOW STANDARD

Some nine drugs manufactured by seven pharmaceutical companies have been tested by the drugs controller of Karnataka in the month of March 1988 and found to be of sub-standard quality. According to a government of Karnataka notification, the public has been cautioned against purchasing the following drugs: chloroquine phosphate injection B.P. (batch no. 043126), chloroquine phosphate injection B.P. (b. no. 44096) and casoplex injection (b. no. 202097), manufactured by Capsules India, Pharmaceuticals, Hyderabad; johnvit injection (b. no. 8717), manufactured by John Dukos Lab, Indore; buprofen tablets I.P. (b. no. 013), manufactured by Beekay Pharmaceuticals, Raigad, New Bombay; chloroquine phosphate tablets I.P. (b. no. 2/87), manufactured by Ramco Pharma, Vapi; dexamethasone tablets I.P. (b. no. 743), manufactured by Aims Pharmaceuticals Pvt. Ltd., Siddhpur; dextrose injection (b. no. TB 152) and normal saline injection I.P. (b. no. TN. 037), manufactured by Tiruvalla Medical Mission Hospital, Tiruvalla; and Pubcot absorbent cottonwool I.P. (b. no. 132), manufactured by Pubcot Puri Surgical Cottons, Nangloi, New Delhi.

— The Economic Times



Direct fertiliser subsidy ruled out

The government said in the Lok Sabha on April 11, that it was not possible to give fertiliser subsidy directly to farmers.

The subsidy was at the producer level and not at the consumer end which would cause problems and bring down fertiliser consumption, Mr. R. Prabhu, minister of state for fertiliser, said.

Intervening in the discussion on the demands for grants for the ministry of agriculture, the minister also ruled out farmers' representation during the fixation of fertiliser prices.

He denied the allegation made by some members that the Rs. 3000-crore fertiliser subsidy given by the government was to help the fertiliser industry.

He asserted that these concessions were to help the farmers. There was a huge stock of urea lying unsold with the manufacturers. This subsidy was not to help them liquidate the stock, he said.

In administered price control, subsidies were given at the manufacturers' end. It was not possible to ensure these to the farmers as there were 125,000 outlets for distribution of fertilisers in the country, he added.

Mr. Prabhu said the government was trying to increase the use of chemical fertilisers in the dryland and other areas where its consumption was much below the national average.

Referring to the enormous increase in the consumption of fertilisers in the country since independence, he said 70 per cent of fertilisers were now being used in the irrigated areas.

The fertiliser industry registered a growth rate of 22.81 per cent in 1986-87. It was a year of consolidation for the industry during 1987-88 and this year a growth rate of 20.61 per cent was expected, he added.

In Punjab, fertiliser consumption had gone up to 150 kg per hectare compared to the national average of 50 kg. Besides chemical fertilisers, the government was also trying to increase the consumption of manure for increasing agricultural production, he added.

Mr. Prabhu said during the first two five year plans, 50 per cent of the fertiliser requirements had to be imported. Now the imports had come down to five per cent, he added.

HFC'S DURGAPUR UNIT : NO CUT IN FERTILISER ALLOCATION

The Union government is understood to have turned down the West Bengal government's request for a reduction in fertiliser allocation made to Hindustan Fertiliser Corporation's Durgapur unit for the current kharif season. The state government, it is learnt, was in favour of a cut of about 10,000 tonnes. This, however, was not acceptable to the Centre.

Encouraged by the good performance of the Durgapur unit during the last rabi season when the allocation was for 39,000 tonnes (in terms of nutrients), the Union agriculture ministry stepped up the allocation to 50,000 tonnes for the current kharif at the last zonal conference.

The rise in allocation to Durgapur, the state government felt, was like putting too many eggs in one basket. In case of disruption of production in the factory, the supply plan for the state would go haywire. For example, the Durgapur unit, it was pointed out, was shut down following a cyclonic storm on March 19 when power supply was disrupted and severe damage was caused to some of the vital equipment of the plant.

It was further pointed out that fertiliser factories in other states which had so far enjoyed the benefit of higher allocations for West Bengal, were now holding sizeable carryover stocks in Calcutta hence they be given more allocations.

However, under the new fertiliser policy, the Union government wants to keep crisscross movement of fertilisers as low as possible. This is because more such movements will mean more transport subsidy. The fertiliser demand of a particular state, the government emphasises should be met as far as possible from the factories located within the state, precisely for the same reason. The Centre has also pruned allocations made to RCF, FCI and others for West Bengal for the current kharif.

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The Centre has further acceded to HFC's request for allocation to Orissa from the Durgapur factory. About 5,000 tonnes of nitrogen out of the total allocation of 50,000 tonnes from Durgapur can be sold by HFC in Orissa where the company has a good marketing network.

In 1987-88, the Durgapur plant produced 126,082 tonnes of urea which was 14 per cent higher than the previous year's production. During the same period, total despatch from the plant at 143,170 tonnes was 23 per cent higher than that of the previous year in December 1987, its output of 24,372 tonnes was highest ever achieved by the plant since its commissioning in 1974.

HFC's Durgapur and Namrup units together will supply about 64,400 tonnes of nitrogen (or about 1.4 lakh tonnes of urea) to West Bengal in the current kharif. This will be in addition to over 30,000 tonnes of nitrogen including over 11,000 tonnes of import being held by the company as carryover stock in the state.

Compared to the kharif of 1986, the actual fertiliser consumption in the kharif of 1987 in West Bengal dropped by a little over three per cent. However, there has been seven per cent rise in allocation to the state for the current kharif over the allocation in the kharif last year.

CLARIFICATION ON LICENSING SCHEME

Exports made under advance licensing scheme by all exporters have always been counted towards fulfilment of export obligations imposed against industrial licences/capital goods licences and there is no change on the new three-year import-export policy announced recently.

The Chief Controller of Imports and Exports, reacting to reports regarding relaxation of compulsory export obligation imposed on certain companies, has clarified the position.

An impression was sought to be created by these reports that the new import-export policy had for the first time permitted counting of exports under advance licences against fulfilment of export obligations imposed on certain firms producing polyester filament yarn polyester staple fibre, in respect of their industrial licences/capital goods import. This, the CCIE said was factually incorrect.

It is pointed out that para 13 (3) of the Import-Export Policy (Vol I) and para 211 of the handbook of procedures only seek to make this position transparent and clear.

It is clarified that the export obligation imposed on any unit under industrial licence/capital goods licence does not preclude the unit from availing any of the concessions and facilities to which an exporter is entitled and includes the facility of advance licences for duty-free import of raw materials and components. This facility is available to all exporters and is not confined to any select group of manufacturers.

GANDHAMARDAN BAUXITE PROJECT CLEARED

The department of environment has cleared the Gandhamardan bauxite project in Orissa subject to the condition that no work would begin till the revised environmental management plan was approved by the environmental management authority of the government.

The annual report of the department of mines says that the work on the project would be resumed after the clearance was received. The department of environment had given clearance in October 1987. The project when implemented, would produce six lakh tonnes of bauxite per annum to meet fully the requirements of the Korba aluminium plant in Madhya Pradesh.

An official press release said the Bharat Aluminium Co., though suffering from frequent power interruptions, achieved 92 per cent capacity utilisation.

STANDARDS FOR PESTICIDES TO BE DEVELOPED

M/s. Environmental Engineering Consultants, (96/97 Mittal Chambers, Nariman Point, Bombay-21) has been selected by Ministry of Environment & Forests, Govt. of India for the development of standards for Pesticides and Pharmaceuticals industries.

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BAUXITE RESERVES DWINDLE :

Balco to search for new mines

The state-owned Bharat Aluminium Company Limited (Balco), which has although turned the corner in the 1987-88 financial year with a maiden net profit of about Rs. three crores is still uncertain about its future in view of critical bauxite reserve position at its existing leased mines at Amarkantak and Phutkapahar. With the present proven reserves at these two mines, this primary aluminium producers with an annual production capacity of 1,00,000 tonnes can function only two years more.

The survival of this public sector giant virtually depends on an alternative bauxite mine. To Balco, a mine of about 200 million tonnes proven deposits of bauxite at Gandhamardan hills in Orissa has been allotted by the Union government on lease for a period of 40 years.

Despite the allocation, Balco management is finding it difficult to create necessary infrastructure at the mine site following stiff resistance from local people, resulting in stoppage of work relating to mine development. Local people are determined to obstruct the on-going work as they fear that between 30,000 and 40,000 villagers staying in and around the hills will be evicted from their soil.

Balco chairman, Mr. P. S. Rao is, however, meeting the Orissa government officials next week to sort out the problem but he said that in Calcutta on April 15, that he was not sure how to solve the vexed problem. So far as Balco is concerned, Mr. Rao's meeting with the Orissa government is very crucial. If the delay continues in regard to mine preparation work at Gandhamadan, Balco's production will suffer a set-back following non-availability of bauxite.

Mr. Rao said that the company produced in 1987-88 a total of 91,000 tonnes of primary metal, against the total capacity of one lakh tonnes per annum. It had set the production target of about 95,000 tonnes for 1988-89.

According to him, Balco had to overcome numerous problems in the process of completing the project in four phases. Non-availability of power from Madhya Pradesh State Electricity Board and lack of infrastructure delayed commissioning. As a result of delay project costs went up. The total accumulated loss also touched Rs. 330 crores.

Mr. Rao and Mr. P.S. Gupta, managing director of the company, were optimistic about the future of Balco. Their optimism was based on the fact that the aluminium availability position would not improve even after National Aluminium Company (Nalco) comes into the market.

Both of them were believed that there was scope to expand Balco's smelter capacity. In line with their thinking, Balco management has prepared an expansion programme which is to be taken up in the Eighth Plan.

MAPS UNIT 'STARTED UP'

The 235 mw second unit of the Madras Atomic Power Station at Kalpakkam about 60 km from Madras, which was shut down four months ago has been "started up" and is expected to be synchronised to the grid shortly, according to a spokesman of the atomic power station.

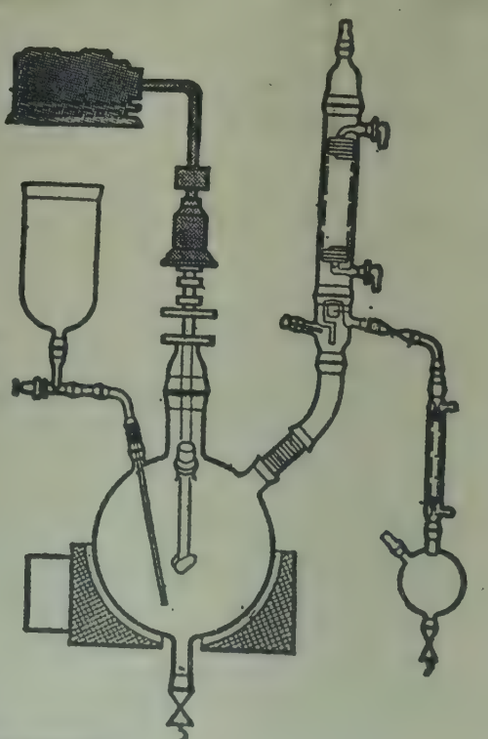
Turbine balancing was now going on, the spokesman said.

The unit was shut down on December 7 for inspection of the sea water tunnel and for checking the system.

The entire system would be tested and if everything went all right the unit could be synchronised he said.

Cracks in the high pressure rotors were detected on inspection and it had been replaced with a new HP rotor brought from the Kakrapara Atomic Power Project. The low-pressure rotor which was also found defective had been rebladed, he added.

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Steady decline in pesticide usage

There has been a steady decline in level of consumption of pesticides during the last 3 years as is evident from the table below :

(i) 1984-85 56,000 MT (Technical grade)
(ii) 1985-86 52,000 MT (Technical grade)
(iii) 1986-87 50,000 MT (Technical grade)

PRODUCTION OF PESTICIDES IN 000 TONNES

The following is the item wise production of Pesticides in the country during the period of 1986-87 :

Item	Production 1986-87
B.H.C.	25.40
D.D.T.	8.00
Malathion	2.70
Parathion	1.20
Metasystox	0.23
Fenitrothion	0.03
Fenthion	0.27
Dimethoate	1.10
Phosphamidon	1.10
D.D.V.P.	0.43
Quinalphos	0.60
Ethion	0.24
Carbaryl	0.05
Monocrotophos	1.90
Endosulphan	2.20
Thimet (phorate)	1.50
Phosalone	0.07
Fenvalerate	0.35
Cypermethrin	0.13
Copperoxychloride	1.20
Captafol	0.05
Captan	0.07
Thiocarbamates	2.90
Nickel Chloride	—
Organo Mercurials	0.20
Carbandazin (Bavistin)	0.16
2,4-D	0.81
Isoproturon	0.92
Paraquat (Cramoxone)	0.25
Basaline	0.25
Dalapon	Neg.
Diuron	0.41
Oycocil/Libocin	—
A.N. Acetic Acid	—
Ratafin	Neg.
Zinc Phosphide	0.43
Alumn. Phosphide	1.34
Methyl Bromide	0.07
Ethylene Dibromide	0.04
Aureofungin	—
Steptecycline	—
Total (Pest)	56.26

CONCESSIONAL DUTY FOR MACHINERY WITHDRAWN

While presenting the Budget the Finance Minister, Mr. N.D. Tiwari has withdrawn the concessional rate of import duty on three items of machinery namely, Stretch Blow Moulding Machines, Multilayer coater/extruding machine and Plastic and Laminate collapsible tube making machine. According to Mr. Goracha, president of The All India Plastics Manufacturers Association, stretch blow moulding machines and multiwall laminated tube making machines are yet to be developed indigenously. There two machines according to him are rightly kept under OGL and should also be given benefit of concessional duty at 35%. Multilayer coater/extruding machines are partly developed indigenously. Particularly Tandem coating or multilayer coating and coextrusion film plants or multilayer film extrusion plants upto three layers have been successfully manufactured by indigenous manufacturers. The machines above three layers require high technology and expertise in the production of film for food packaging. The AIPMA has therefore requested that multilayer extrusion plant above three layers falling under Sr. No. 32 of notification No. 125/86 may be allowed to import under OGL as also with the benefit of concessional rate of import duty at 35 per cent.

ICMA WARNS AGAINST LARGE IMPORTS

The Indian Chemical Manufacturers Association, (ICMA), has pointed out that liberal imports of pesticide formulations will adversely affect a number of small-scale industries.

In a memorandum submitted to the finance and industry ministers, the association has observed that reduction in customs duty on certain pesticides and pesticide intermediates and simultaneously placing them on OGL will result in a flood of imports affecting the domestic industry.

ICMA has pleaded that where there is sufficient local manufacturering capacity as in the case of monocrotophos and butachlor, OGL imports need not be allowed.

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NEWS DIGEST

INDIA MAY SET UP GAS CRACKER IN S. ARABIA

An Indian owned gas cracker in Saudi Arabia, predicated to captive requirements of this country, could soon become a reality according to reliable sources.

The need for such a cracker has only now been fully realised in official circles. It will have three principal advantages. First, gas as the feedstock will be better suited to produce ethylene, propylene and butadiene at relatively lower prices than naphtha or Natural Gas Liquids (NGL). Even the capital cost of a gas cracker is much lower than that of a naphtha or NGL cracker as planned for Gujarat.

Secondly, the availability of hydrocarbons in oil-rich Saudi Arabia which is the foremost exporter of petroleum products, is just under 40 per cent of the world's total proven reserves. These should last at current production rates for about 150 years.

Finally, even very intensive efforts made to import ethylene and propylene on a long-term contract basis, including for the much-delayed Haldia project, and for a shorter period for the Maharashtra Gas cracker, have porate link up in such a venture proved futile.

This was to be expected as less than one per cent of the world's total ethylene production is moved in ocean going tankers. And even this minuscule movement includes captive trade.

The Saudi Plants already established are amongst the best managed and are currently operating at or abcve the name plate capacity. However, pricing could be a major hurdle as it has been for fertiliser plants over the last 15 years when the idea was first conceived. The task of producing a "cost plus" or a "market related" formula, and the manner in which these can be determined in an ever shifting market scenario, has proved beyond any mutually acceptable solution. So far it is understood that the proposed cracker may have an ethylene capacity of at least 400,000 rpt four lakh tonnes per annum and this may even go upto half a million tonnes.

BCCL TURNS CORNER

Bharat Coking Coal Ltd. (BCCL) has turned the corner in the financial year 1987-88 which has just ended.

According to an official release, in Patna, the performance of the company was a matter of "concern" till the beginning of the financial year 1986-87. But there was a big improvement in overall performance of the company during the last financial year.

Sufficient quantity of coking coal was available in stockyards of steel plants as well as power houses throughout the country last year which was also indicative of improvement in performance during 1987-88.

The achievement in the field of production was of the order of 25.11 million tonnes during the year which marked a 4.6 per cent growth over the previous year, i.e., 1986-87.

The release also claimed that output per manshift improved to 0.68 compared to 0.60 in 1985-86, registering 13 per cent growth.

NFL PROFIT PUT AT RS. 50-CR.

The National Fertiliser Ltd (NFL) in the public sector has closed the year 1987-88 with a provisional pretax profit of Rs. 50 crores.

The NFL Managing Director, Mr. S. N. Jain, said that the operational performance of all the existing units swept past previous records registering new peak levels of production. The overall production achieved was 10.4 per cent more than the previous record.

He said the high level of performance was primarily due to better capacity utilisation, better energy management, improved maintenence of plant and machinery, meticulous planning and a congenial working environment.

The tempo of production was kept at a high level throughout the year, he said.

The foremost achievement of NFL during 1987-88, Mr. Jain said, was the commissioning of the super fertiliser project at Vijaipur (Madhya Pradesh), the first of the six gas-based fertiliser plants on the H-B-J pipeline

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Recent progress in performing and understanding Phase Transfer Catalysis (PTC)

E.W. Dehmlow, who has done pioneering and very valuable work in the area of PTC, has given a very useful concise account of this subject. PTC can be used even when cations such as metal ions, diazonium ions, NO_2+ have to be transferred or metal atoms either as crown complexes or in the form of radical salts for reducing purposes into non polar organic media. Here crown ethers or even anthracene has been used as PTC. Further non-charged species like H_2O_2, N_2H_4, etc. can also be extracted through PTC.

The extraction coefficient of anions increases by a factor of 10 when the total number of carbon atoms in the quartnernary ammonium salt is increased by 2. Typically 2 to 5 mole % of PTC is employed. For solid-liquid reactions, a small amount of water may be beneficial as an "omega" phase is formed.

Some unexpected results in PTC have been (i) when isocyanates were stirred with a PT Catalyst (e.g. Aliquat 336) and a suitable inorganic salt like NaCN, an exothermic trimerization to the isocyanurate occurred immediately (ii) The solid-liquid PTC reaction between sodium trichloroacetate and allyl bromide leads to CH_2 = CH-CH_2-O-CO-CCl_2 -CH-CH = CH_2. (O. Chizhov (Ed). 6th IUPAC Symposium. Organic Synthesis: Modern Trends, Blackwell Sci., Pub. Oxford, U.K., 1987, p. 9, 179-189)

The discovery of Ibuprofen

Professor Stewart Adams, who was a member of the research team of Boots which came out with this important drug, has given a fascinating account of the discovery of Brufen. Different types of arthrites, including rheumatoil, afflict a large number of people. Brufen was the first 'propionic' non-steroidal antiinflammatory agent and it is 16-32 times more active than aspirin; as an analgesic it is 30 times more effective than aspirin and as antipyretic it is 20 times more effective. Ibufenac (*p*-isobutyl phenyl acetic acid) has not been found to be very good (it was used for many years in Japan) and the same was the case with *p-tert* butyl phenyl acetic acid. It was a sun-burnt guinea pig which provided an easy method of checking the efficacy of the drug (uv erythema technique)! Seven years of work on derivatives of phenoxy acids did not yield any useful drug. Brufen is good for period pain for women as well. It is also good for dental pain. (*Chem. Brit.*, 1987, **23,** No. 12 (Dec.), 1193-1195).

A pure form of Ibuprofen

The commercial variety of Ibuprofen is racemic and it is known that pure **S** variety is the pharmacologically active isomer and is 100 times more potent than the **R**-isomer. Thus if pure S were to be used than the body will not have to metabolize the useless R-isomer. A catalytic membrane process has been developed to resolve the racemic mixture. (*Chem. Week.*, 1988, 24 Feb., p. 35).

A porous, fluoropolymer fabric

A new waterproof breathable fabric for outdoor wear has been introduced by W.L. Gore and Associates of USA. This consists of a woven fabric, such as Nylon, backed with a thin microporous fluoropolymer film which contains millions of tiny pores per square inch. This allows water vapour to escape but does not allow moisture to get in. (*Chem. Week.*, 1988, Feb., p. 35).

Hydrogen recovery from lean streams

Exxon have claimed that Zr-Mn or Zr-Ni alloys form good hydrides and desorption is easy. Hydrogen contained in a variety of gases, including those containing NH_3, H_2S, etc. can be processed. Typically adsorption could be at 50 atm. and desorption at 1 atm. and 300°F. (E.P. 240,252, Oct. 87, *Chem. Abstr.*, 1988, **108,** 78135).

Biochemical route for 1-Isoleucine from Ethanol

Mitsubishi Petroleum Co. has used bacteria to react ethanol with alpha-aminobutyric acid to produce L-isoleucine; D-form of the acid is recycled to form the racemate.

High quality water for pharmaceutical industry (PI)

Water required in PI has to meet very stringent requirements and impurity level has to be less than 5 mg/l; water for injection has still more stringent requirements. In an ICI plant in U.K. water is provided with average conductivity of 1 μs/cm; strict control of bacteria is insisted as it can infect distribution systems, and the count has to be less than 10 cfμ/ml. R. Hill and K. Ward have given a useful account of a facility for 15 cum/hr. The bore well water is first treated with a high dose of uv (254 nm). Mixed bed ion exchange columns is then used to remove dissolved solids. PVC dipped steel pressure vessels are used with uPVC values. The DM water is filtered to 1 μm and again irradiated by uv before entering the distribution system. (*Chem. Engr.,* Instn. of Chem. Engrs., UK., 1987, Dec, p. 17-18).

Crystallisation: Role of crystal chemistry

In speciality chemicals, including drugs and drug intermediates, the role of crystallisation has now been recognised. While chemical engineers can now deal effectively with mixed suspension mixed product removal crystalliser (MSMPRC), there are problems in batch suspension or melt crystallisation. Crystals physical form such as morphology, its purity or its internal structure may be quite important. Appreciation of crystal chemistry is important -- here problems are structural which are not amenable to the kind of generic modelling that can be used for crystal size distributions. The addition of small additives can change morphology dramatically. A recent study on crystallalisation of benzamide from ethanolic solution with or without a small amount of benzoic acid brings out very good results which can be explained on the basis of hydrogen bonding; additional results are brought out by using *o*-toluamide and *p*-toluamide. Different structures of the same drug may have different biological availabilities.

It is necessary to have a hard look at physical and solid state chemistry in crystallisation of speciality chemicals. (*Chem. Engr.,* Instn. Chem. Engrs., U.K., 1987, Dec, 24-27).

Oxidation with H_2O_2 in two-phase systems: use of heteropolyanions (HPA)

Heteropoly-11-tungstates seem to be very good homogeneous catalyst for oxidation of cyclohexene with H_2O_2, Tetraalkylammonium--HPA can be dissolved in the organic phase. Aqueous solution containing 30% H_2O_2 has been used by Schwegler **et. al.;** dichloro ethane was used as a solvent for cyclohexene. The intially formed epoxide is rapidly converted into the *trans*-1,2 cyclohexenediol in the acidic aq. phase. Further oxidation of diol with H_2O_2 to adipaldehyde and 1,6 hexanedioic acid is possible. Reaction occurs in the organic phase. (*Tetrahedron Lett.,* 1988, **29,** No. 7, 823-826).

Advantages of attaching catalysts and reagents to polymers

D.E. Bergbreiter has given a summarised status of this subject (which we have covered in this column on several occasions). The major breakthrough in this area came in 1960's with Merrifield's solid-phase peptide synthesis. Supported catalysts and reagents allow easy product isolation, possible catalyst or reagent recovery and recycling, unique multistep reaction schemes, enhanced catalyst stability and altered reactivity. The use of soluble macromolecular reagents or catalysts avoids the problems of the polymer's insolubility during the reaction. The preparation of terminally functionalized ethylene oligomers is desired; such supports have been used for PTC. Solubility variation with temperature can also be invoked. (*Chemtech,* 1987, November, 686-690).

Gas absorption in slurry reactors: Adhesion of particles to bubbles

O.J. Wimmers and J.M.H. Fortuin have made a very interesting study and shown that catalyst particle like Pd/C in an aq. electrolyte solution show an adhesion to hydrogen bubbles which is so large that in slurry reactors gas bubbles will be covered partly by adhering catalyst particles. Measurements of rates of absorption of H_2 into an aqueous hydroxylamine phosphate solution, as a function of conc. of catalyst particles, have shown a marked enhancement in the rate due to the above phenomenon. Pd/Al_2O_3 catalyst particles does not show the above adhesion behaviour. Enhancement factors as high as 4 have been observed. (*Chem. Eng. Sci.,* 1986, **43,** 303-319).

Inorganic membrane technology (IMT)

Anotec separations have made use of the original Alcan anodising process to make alumina mem-

branes with 0.2 micron pore size (symmetrical as well as asymmetrical); pore size can be tailored. Such membranes can be thin and show high throughputs and can withstand a variety of aggressive chemicals apart from withstanding very high temperatures. Such membranes may be helpful even in the removal of colloidal silica in water. (*Chem. Eng.,* Instn. Chem. Engrs., U.K., 1987, Nov. p. 22).

Photochlorination of aromatic compounds in the side chain

Stauffer Chem. Co. (USA) has claimed that 2-methyl-methyl benzoate can be side-chain chlorinated at -5°C with uv, with HCl gas, to give 74% Me 2-(chloromethyl) benzoate. (US 4,689,425, Aug. '87, *Chem. Abstr.,* 1987, **107,** 154067).

Enzyme-catalysed cyanohydrin synthesis in organic solvents

Effenberger **et. al.** have shown that cyanohydrins can be made by the reaction of HCN and aldehydes in ethyl acetate medium with *mandelonitrile lyase* enzyme catalyst with ee approaching 99% in some cases. (*Angew Chem. Int. Ed.,* Engl., 1987, **26,** 458).

Performance plastics: why not Thermosets?

P.R. Lantos has given a cogent argument for considering thermosets in place of engineering plastics for higher temperature applications. It seems that there is almost a direct relationship between the price of a thermoplastic and heat distortion temperature: thus polypropylene/polystyrene are the cheapest and liquid crystal polymers are the most expensive. The key weakness of the thermosets is their low impact strength. Phenolics are now receiving increasing attention. (*Chemtech.,* 1988, Feb., 99-102).

Serendipity at work

A number of industrially important processes and products owe their origin to serendipity. Charles Goodyear encountered vulcanization of rubber accidently. Teflon was "formed" in the cylinder containing C_2F_4 as no gas came out even though the weight of the cylinder was the same as at the time of filling! Polyethylene oxides were also accidently found in the cylinder storing ethylene oxide. Both low and high density polyethylenes were discovered accidently; even the highly active catalysts for high density variety based on Ti and Zr compounds were found accidently. Both saccharin and aspartame were found to be sweetners accidently. Silicon fibres were also found accidently. The renowned PF resin was also found accidently when Leo Baekland was attempting to make shellac from phenol and HCHO.

Even in the Xerox process the basic idea of removing the excess toner was inspired by the polishing cloth for shoe police! (P.J. Hannan **et. al.,** *Chemtech.,* 1988, Jan., 18-21).

Separation of 2-methyl butanal (MB) and methyl isopropyl ketone (MIPK)

It has been claimed (by Goodyear Tire & Rubber Co.) that MB can be cyclotrimerized and then MIPK can be conveniently separated. The trimer can be converted back to MB with Nafion catalyst. (U.S. 4,701,561, Oct. 1987, *Cf. Chem. Abstr., 1987,* **108,** 40094).

Lasers in synthesis

Industrial photochemistry has many applications: BHC, Benzyl chloride, etc. For economic application of lasers, the effective cost of the photons must lie considerably below that of the desired product. The use of lasers allow 1,1 dichloroethane to give 1,1,1 trichloroethane in high yields compared to the unwanted 1,1,2 trichloro ethane (9:1 with lasers vs 4:1 with Hg lamp and 1:1 for thermal process). The conversion of acetone to ketene is facilitated by using KrF laser. The case of Vitamin D_3 stands out as an important application of lasers as these give improved yields compared to Hg lamps. The synthesis of the beetle attractant pheromone-Frontalin is assisted by lasers. The conversion of carvone to carvone-camphor is also assisted. (Kleinermanns, K. and Wolfrum, J., *Angew. Chem. Int. Ed.,* Eng., 1987, **26,** 38-58).

Gas absorption via permeation through membranes: High gradient magnetic field

Hitachi have claimed that gas mixtures containing para-magnetic and non-paramagnetic gases, e.g. air, can be separated through membranes under an imposed magnetic field at right angles to the membrane and flow direction. Slowly flowing paramagnetic component -- enriched gas permeate the membrane. (U.S. 4,704,139, Nov. 1987, *Cf. Chem. Abstr.,* 1988, **108,** 40479).

Directed Homogeneous Hydrogenation

J.M. Brown has given an excellent state-of-the-art account of this subject which in the course of last 4 to 5 years has made rapid progress. Directed hydrogenation of olefins, employing cationic rhodium or iridium catalysts, has considerable potential as high selectivity is realised under mild conditions. The only requirement is the availability of a polar functional group in proximity to the double-bond which remains bound to the metal during hydrogenation. The earlier example of the selective hydrogenation of the disubstituted double bond in carvone in the presence of [RH $(PPh_3)_3$] may be cited: here the trisubstituted double bond remains intact. Kinetic resolution in homogeneous hydrogenation is possible and the best substances for asymmetric hydrogenation are, ß-unsaturated acids or esters with a chelating group attached to the α-position.

A comparison between homogeneous and heterogenous catalysis brings out some striking features. In the latter case the choice of metal, support, and solvent are all crucial and often all three must be varied before optimum stereocontrol is achieved. (*Angew Chem. Int.* Ed. Engl., 1987, **26,** 190-203).

Surfactants

An exhaustive report has appeared in the September 1987 issue of *Soap/Cosmetics/Chemical Specialities* (p. 26-56). The U.S. market was around $3.5 billion in 1987; 36-40% of this was contributed by heavy duty laundry liquids. Fatty alcohol ethoxylates are gaining increasing importance over nonyl-phenol ethoxylates as the former are biodegradable. Exxon has introduced a new linear C_{13}-C_{15} alcohol. Continental Co. has introduced alkylated diphenyloxide -- disulphonate based surfactants. The use of STPP is going down.

TEKNO (of Italy) have introduced a new, low cost, energy saving, "cool and dry" process for making detergents based on reaction of liquid materials with solids and where a lot of soda ash can be incorporated.

***p*-Hydroxy benzaldehyde (HB)**

It has been claimed that *p*-cresol can be oxidised in an alcoholic alkaline medium (e.g. MeOH) with O_2 in the presence of Fe (III) to give HB. At 50% conversion, 60% selectivity has been claimed. (*Chem. Abstr.,* 1988, **108,** 55650).

Extraction of fatty acid from cod liver oil (CLO)

Polyunsaturated acids from CLO are reported to have a beneficial effect on the cardiovascular system. Decosahexaenoic acid (DHA) has been recovered by Wright, Kuo and Corey in amounts equal to about 10 to 15% of the CLO. The method of separation is based on the selective formation of an iodo gamma lactone from DHA. (*J. Org. Chem.,* 1987, **52,** 4399).

Epoxidation of olefins: Electrochemical route

Shell have developed a direct electrochemical method where the oxidation occurs at the anode and reduction of O_2 occurs at the cathode. This reaction is mediated by silver-pyridine complexes; Ag(II) goes to Ag(I) and gets reoxidised electrochemically, propylene and butylenes have been successfully epoxidised; ethylene was efficiently converted. With C_6 and higher olefins, mass transfer problems are important and good yields have not been realised. *(Chem. Eng. News,* 1987, 28, Sept. p. 29).

MTBE from Butane

Clark **et. al.** (of Air Products, USA) have given an account of the recent successful operation of Catofin unit for isobutylene from isobutene (Texas Petroleum, since April 1986); a large unit is under construction in the North East of USA. Butane can be isomerised to isobutane which is dehydrogenated in fixed bed reactors and the product can be directly used for making MTBE and unconverted isobutane is recycled. The selectivity for conversion to isobutylene is 90%. (*Energy Progress,* 1987, **7,** No. 3, p. 164).

Para Dichlorobenzene (PDCB) from chlorobenzene

Konno **et. al.,** (of Kureha of Japan) have claimed that L-type Zeolites, with 6-14% (as K oxide) (+ 10 ppm water) allow highly selective chlorination to PDCB (87.6% selectivity). (Jpn. Pat. 62,87,536, April 1988, *Cf. Chem. Abstr., 1988,* **108,** 74964).

A similar claim has been made by Nakano **et. al.** (of Toyo Soda Mfg. Co. Ltd.) and they claim 92.1% *para* derivative and 7.2% -- ODCB at 67% conversion. (J.P. 62,108,830, *ibid,* 74967).

Plastic units in crisis

The plastic industry — popularly known as 'sunrise' industry — employing about four lakh people in the country, is facing crisis owing to acute shortage of raw materials.

Mr. M. L. Lahoti, president of the Indian Plastics Federation, said the situation had further worsened by the recent price hike of its prime raw material, low density polyethylene (LDPE) by the Indian Petrochemicals Corporation Limited (IPCL).

The corporation is the only manufacturer of LDPE which is used by plastic processors for important applications such as milk packaging, extrusion costing, wires and cables.

Mr. Lahoti said the country produced 3.14 lakh tonnes of raw material against the annual requirement of 6.5 lakh tonnes. To meet the shortfall, specially in the field of HDPE, LDPE, PVC and PP, the industry depended on overseas sellers giving a higher premium.

The price difference between home and imported materials sometimes was Rs. 7,000 per tonne. Higher rate of customs duties and fall in value of Indian currency were some of the reasons for the wide difference, he said.

To overcome the problems, Mr. Lahoti suggested reduction of customs duty, setting up of raw material bank and effective functioning of the high-power committee for monitoring and controlling the prices of raw materials.

He also suggested setting up of high capacity processing units in all the regions instead of concentrating on western region. The eastern region found it difficult to compete with other regions as it had to brought raw materials from other parts of the country. The eastern region, he said, also suffered from lack of infrastructural facilities.

He said negative attitude of financial institutions, continuous shifts in government policies and lack of training facilities also came in the way of the industry's growth.

Mr. Lahoti said the plastic industry had a big role to play in boosting the national economy. It could aid in the growth of the electronics and telecommunication industries as well.

The industry, he said, consumed less energy and its employment potential was much higher than that of other industries.

Although plastics had a wide field of application including pond and canal lining, protection of crops and irrigation, yet its per capita use in the country was 0.6 kg against 70 kg in advanced countries, he added.

Referring to the plight of the industry in West Bengal, Mr. Lahoti said the imposition of turn-over tax, introduced from the current financial year, would add misery to the already crippled situation.

He said the turn-over limit of Rs. 25 lakhs was low considering the present inflation rate of about 10 per cent.

He urged the government to reconsider the decision for the benefit of about 4,000 plastic units in the state employing over one lakh people.

PESTICIDE ITEMS : SSIs HIT BY IMPORTS

The Indian Chemical Manufacturers Association has pointed out that liberal imports of pesticide formulations will adversely affect a number of small scale industries.

In a memorandum submitted to the finance and industry ministers, the Association has observed that reduction in customs duty on certain pesticides and pesticide intermediates and simultaneously placing them on OGL will result in a flood of imports affecting the domestic industry.

ICMA has pleaded that where there is sufficient local manufacturing capacity as in the case of monocrotophos and butachlor, OGL imports need not be allowed.

It has also noted that the domestic agro-chemicals industry is likely to be hard hit by the steep reduction in customs duty on pesticides and pesticide intermediates.



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RS. 600 CRS EXPANSION BY ECL :

CIL approves scheme

The empowered committee of Coal India Limited, (CIL), has approved the Rs. 600-crore scheme for expansion of the Rajmahal opencast mines of Eastern Coal-fields Limited, (ECL). It is proposed to expand the coal production from five million tonnes to 10.5 million tonnes per annum. The project will be posed to the government shortly.

As the Rajmahal coal mining project is linked with NTPC's super thermal power station at Farakka, the management of ECL was asked to prepare an expansion scheme keeping in view that the Rajmahal mines would be required to supply huge quantity of coal to Farakka power station in the near future. ECL, accordingly, had submitted the detailed project report of the expansion scheme to the empowered committee which at its meeting in New Delhi recently approved the scheme, subject to certain modifications in technical aspects.

The most interesting part of the expansion scheme is that Canadian Commercial Company, (CCC), has offered a loan-cum-aid of about US $ 120 million, while Metchem, a subsidiary company of US Steel will be responsible for undertaking the execution work. Metchem, which has already established its credibility in India by executing the Kudremukh iron ore project will, however, be for the time executing the coal mining project in India.

The empowered committee is learnt to have sought guarantee from Metchem over three issues a) the expansion programme should be completed within six months from commencement of work, b) there should be hundred per cent capacity utilisation for producing grade-F quality coal, against the existing production of 60 per cent grade-F and 40 per cent grade-G coal. This apart, output per manshift, (OMS), should be 16.35 tonnes, the committee noted.

If the assurances are given by the Canadian company, CIL will not wait to send the project report to the Public Investment Board, (PIB), for its project will, however, be given by the project will, however, be given by the cabinet committee of economic affairs, (CCEA).

Another project report relating to the development of Lakhanpur opencast coal mines, submitted by South Eastern Coalfields Limited, (SECL), was also examined by the empowered committee at its last meeting. SECL had forwarded a proposal for developing a new mine with an annual production capacity of five million tonnes. An investment to the tune of about Rs. 120 crores was estimated for this project. The Lakhanpur project was prepared linking the IB Valley thermal power station in Orissa.

It is learnt that the project has been sent back to SECL for rectification of the project reports which were prepared on the basis of technology available in the country.

ONE — FIFTH OF COAL PROJECTS SUFFER SLIPPAGES

Of the total number of coal projects sanctioned by the Centre in the past 15 years one-fifth of them suffered slippages for various reasons, according to official sources.

The Centre sanctioned 245 projects under the Coal India Limited (CIL), each involving a minimum outlay of Rs. two crores during the period. The total investment of Rs. 6,650 crores is envisaged to raise the coal production to 208.80 million tonnes per annum in the coming years.

Altogether, 87 of the projects have been commissioned and 105 are nearing completion while the rest have suffered slippages owing to problems relating to land acquisition, power supply, belated delivery of equipment and tardy execution of turnkey projects by external agencies, adverse geomining conditions and unsuitability of mining methodology.

Coal India, however, has evolved remedial measures to arrest slippages and expedite work on completion of the remaining projects on schedule, the sources said

These include standardising the organisational structure for project control and monitoring, preparation and judicious implementation of manual for both underground and opencast mines and computerisation for date sequence.

Stress has also been laid on standard reporting on periodical and exceptional basis to chairman and directors (technical) of the subsidiaries.

Official sources said Coal India has for the third successive year surpassed its production target. CIL ended the year with a production of 159.06 million tonnes.

The increase of 14.29 million tonnes (9.9 per cent) is the highest ever quantum growth recorded by CIL in any single year. The target was achieved in spite of the six-day coal industry strike last month.

Coal India's performance in the first three years of the Seventh Plan has been constantly higher than the targets.

CIL achieved the demand satisfaction of 93.5 per cent by despatching 153.33 million tonnes in 1987-88 as against 141.7 million tonnes in the previous fiscal year, registering a growth of 8.21 per cent.

Demand satisfaction of the power sector, CIL's largest consuming sector, was 101.5 per cent of the demand forecast by the Planning Commission.

Higher despatches were possible due to increase in wagon loading, daily average of which went up from 11,288 (FWS) in 1986-87 to 11,734 this year, the sources added.

RAKE SHORTAGE HITS MOVEMENT OF IMPORTED COAL

Transportation of imported coking coal from the Paradip Port to different user industries, mostly the inland steel plants, has been seriously affected due to non-placement of required number of rakes by the railways, according to official sources in Paradip.

This has resulted in huge stockpiling of the imported coke at the port head, the sources said.

About 1,17,000 tonnes coking coal, per month, were imported through the Paradip Port in 1987-88, which needed about 60 rakes for their transportation to the user industries. The railways were, however, nominating only 30 rakes per month for the past two months to move the inland stocks.

As a result, the coal yard of the port was choked with a stock of over 1.5 lakh tonnes of coke, the sources said.

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Gujarat to set up chemical container facility at Hazira

The Gujarat government through the agency of Gujarat Industrial Investment Corporation (GIIC), has decided in principle to set up in the joint-sector, a chemical and petrochemical container facility at Hazira, near Surat. This facility would involve dredging as well as land development and facility for storage of chemicals both cryogenic and non-cryogenic in nature.

The total cost of the project would be around Rs. 75 crores and the equity of each an infrastructure scheme would be roughly of Rs. 25 crores. It is proposed to take up this project with financial institutions for funding the remaining Rs. 50 crores. The project will be completed within a period of 24 months so as to be co-terminus with the development of MGCC gas cracker as well as the development of the gas cracker project to come up at Kawas in Gujarat.

The most important aspect of this project would be that the pipeline will be carried into the sea i.e. it will have submarine pipeline in order to ensure that large tonnage ships of 10,000 to 15,000 tonnes, are allowed to come up to the coastline of Gujarat and there from a submarine pipeline will take over to meet various intermediate supplies to be supplied to the storage terminal at Hazira. From the storage terminal it is planned to have a buffer stock kind of operation, which would cater to the requirements of various petrochemical projects in the entire country. This will not only ensure a ready supply of these previous raw materials but would also ensure that the price war indulged in by the international cartel is prevented.

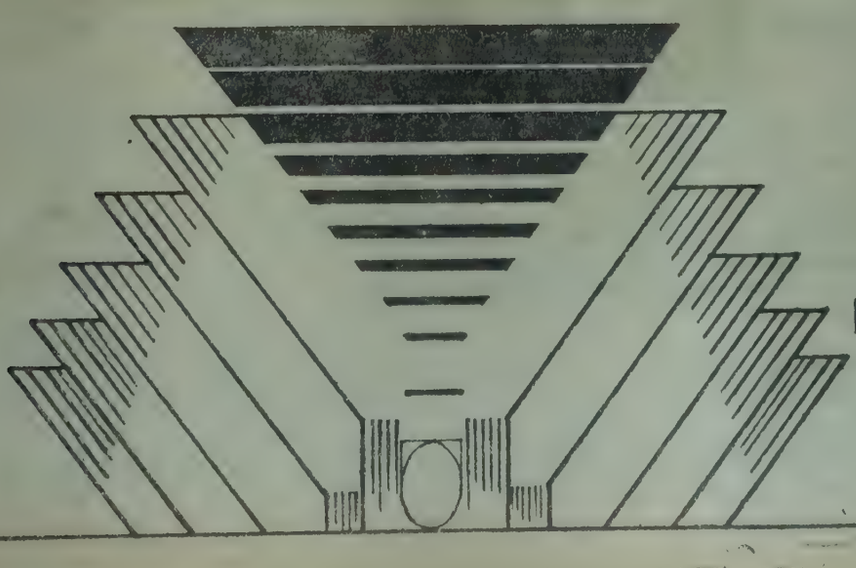
The demand for various raw material such as HDPE, LDPE, PVC etc, is growing at a very fast rate. Today, the import is around five lakh tonnes which is valued at around Rs. 600 crores. The import is likely to go up to about 15 lakh tonnes by 1994-95 and at the present value, it will cost around Rs. 1,800 crores. In order to maintain the country's demand for plastics, the supply of intermediate materials for the production of these plastic materials assumes crucial importance.

The project will be of a unique kind and would almost be a kind of Rotterdam for India, in the times to come. The selection of the site at Hazira is the best location from the point of view of the three petrochemical complex which will be nearby in the port location, which would make it an enviable location not only for import of raw material but also in terms of export of the finished products from the port in future.

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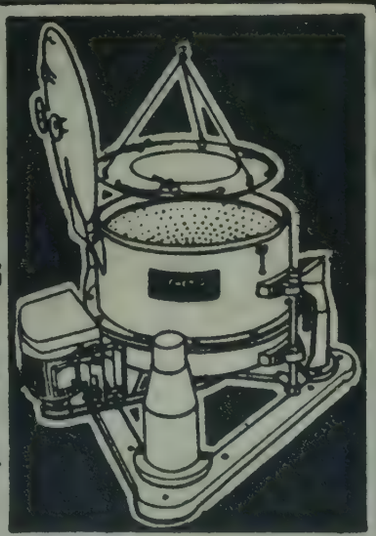
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Tuticorin alkali reports encouraging results

Tuticorin Alkali Chemicals and Fertilisers (Chairman : A.C. Muthiah) is engaged in the manufacture of soda ash and ammonium chloride. After successfully launching a detergent "Super Chase" in the Southern states of India, the company is now contemplating diversification in low investment and high return areas. As a first step, it has decided to take over Sterling Pesticides, a partnership firm engaged in the business of formulation of pesticides at its unit in Trichy.

With Tanjore, Trichy and Madwai which are the major pesticide consuming areas, the prospects for marketing of pesticides are good. Moreover, the company by utilising the existing strength of its dealar network will be in a position to cut down its marketing costs.

Besides going in for pesticides TAC, the company is also exploring the possibilities of onlarging its trading activities by taking up agencies of reputed manufacturers. As it is, the company is already acting as the agent for Albright Morarji and Pandit for selling sodium tripoiy phosphates, Meanwhile, it has commenced the sale of yellow sodium sulphate of Tamil Nadu Chromates and Chemicals, in addition to quality powdered salt.

Apart from these ventures, the company is going ahead with the implementation of its debottlenecking D.G. set schemes which envisage increase in the capacity of its plant by 15 per cent to 75,900 tonnes per annum. The schemes are expected to be completed by the end of 1988.

The company has reported excellent working results for the year ended December 1987. Gross sales at Rs. 39.01 crore reflect a rise of nearly 20 per cent over the previous 18-month period (on annualised basis). With the growth in income, gross profit has gone up by to Rs. 11.79 crore from Rs. 10.46 crore ended during the 18-months period ended December 1986.

The profit margin as measured by gross profit in relation to net sales has rise to an impressive 32.2 per cent from 23.2 per cent. This handsome rise in profit has enabled the company to report a net profit of Rs. 4.06 crore as against the loss of Rs. 1.03 crore incurred in the previous period. Though the average earning per share works out to Rs. 3.14, the directors in the apparent bid to build up reserves have not proposed any dividend.

The encouraging results were achieved in spite of lower production of both soda ash (3,718 tonnes per month against 4,005 tonnes in 1985-86) and ammonia chloride (3,863 tonnes against 3,878 tonnes). This was mainly on account of the shut down of plant for want of raw materials carbon dioxide and ammonia for 74 days during the year. The other major constraint of inadequate water supply was met by identifying water conservation areas and recycling waste water for plant use.

Income from the sale of soda ash and ammonia chloride was, however, marginally better at Rs. 2.06 crore per month against Rs. 1.99 crore. This rise, coupled with the Government price subsidy of Rs. 13.05 crore (which included arrears of Rs. 4.90 for the period April 1985 to December 1986), boosted the total income to Rs. 39.01 crore.

ANTI-CORROSIVE CHEMICALS JOINT VENTURE

Dinol International AB, a world leader in anti-corrosion chemicals is setting up a joint venture in collaboration with Shroffs 'Technical Services Pvt Ltd. for the manufacture of a number of anti-corrosive chemicals required mainly in the automobile industry.

The joint venture, Dinol-Shroff (India) Pvt. Ltd., would be set up at Tarapur at a cost of Rs. 60 lakhs. The government of India has already approved the foreign collaboration.

According to Mr. S. Y. Rege, chairman, the company, would be initially importing the DINOL products from the collaborator. The production of this range of products would be undertaken by the company from the basic stages subsequently.

The company will also be providing all necessary technical services in use and application of the company's products with the technical personnel, who are trained at the collaborator's plant in Sweden.

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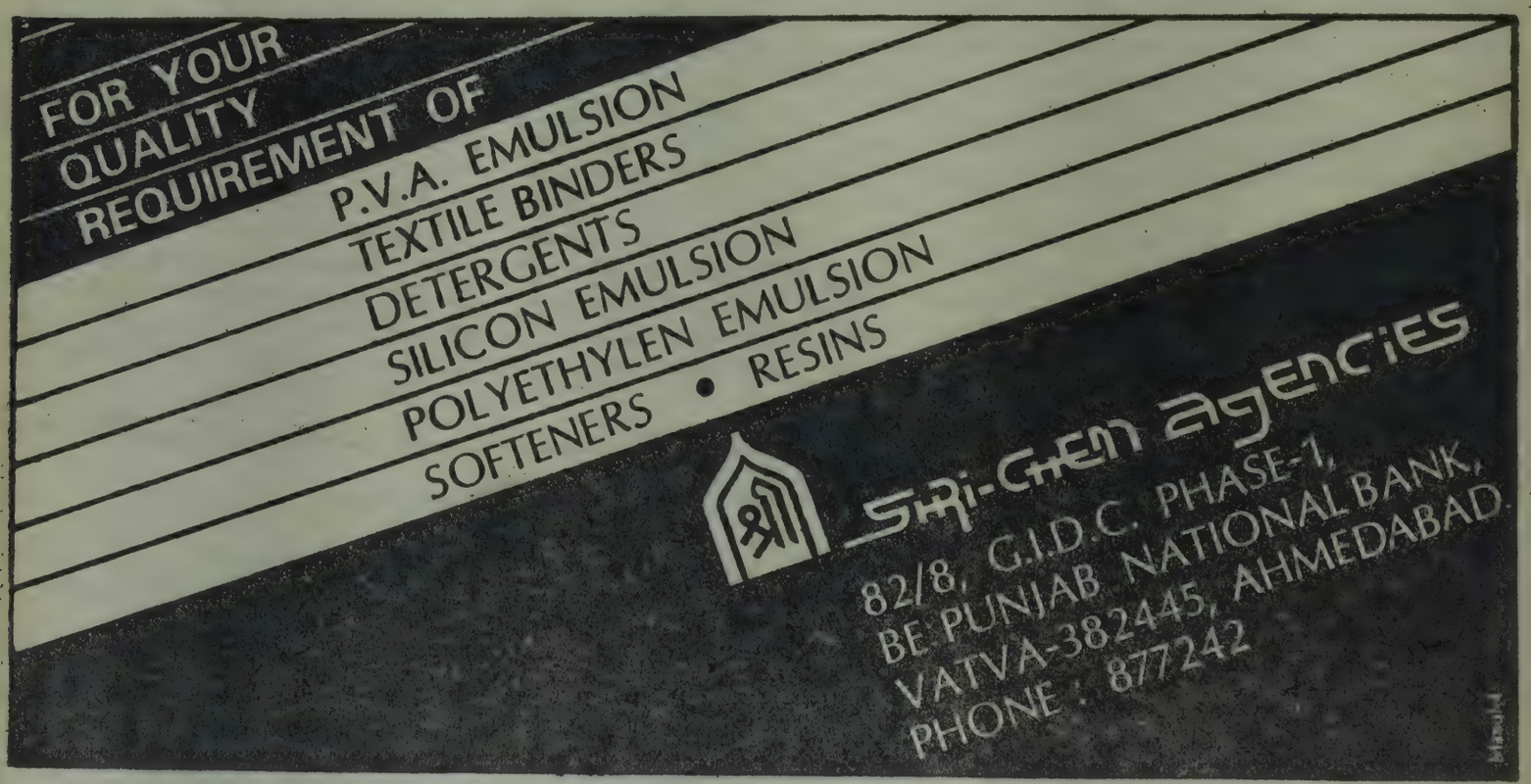
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Water pollution causes 40 PC human, animal diseases

The use of more and more dangerous chemicals in industries, insecticides and pest control, has in the past few decades polluted our rivers and other drinking water resources, causing a great risk to human health and environment. "Today, the polluted water has become a direct cause of about 40 per cent human and animal diseases."

Making this observation, Mr. Vilasrao Deshmukh, Maharashtra minister for revenue and public works, has said these dangerous chemicals have been rendering thousands of plant and animal species extinct every year.

Mr. Deshmukh was inaugurating the sixth all-India annual convention on water pollution in Bombay, which jointly sponsored by the pollution control boards of Bihar, Gujarat, Jammu & Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Orissa and Uttar Pradesh.

Mr. Deshmukh said that about 45 per cent of Bombay's pollution had stomach ailments because of pollution of drinking water. A recent survey had shown that the drinking water, being supplied in 11 cities of Uttar Pradesh, was not fit for human and animal consumption. About 98 per cent of the residents of Varanasi were suffering from stomach ailments. "And every minute three people, mainly children, die in the Ganga basin alone due to water-borne diseases," he said.

Turning to air poilution, Mr. Deshmukh said that about 1,700 tonnes of pollutants were being discharged into the atmosphere in Bombay every day. And automobiles accounted for 60 per cent of the atmospheric pollution in the city.

He said that the problem of pollution should be solved by creating mass awareness about the hazards. "Certainly, the persons who run industries would not need to be educated in this respect," he said. He said there were stringent laws like the Environment Act (1986) and the air pollution Act which prescribe a punishment of three months' imprisonment or a fine of Rs. 20,000 for causing pollution.

Earlier welcoming the delegates, Mr. S. Narisetti, director of the National Centre for Technical Development, stressed the need for evolving sound and pragmatic strategies for preserving a clean environment. He advocated severe penalty for causing pollution.

Delivering the keynote address, Mr. C. D. Oomachen, chairman of the Maharashtra Pollution Control Board said that presently 114 cities, each with 50,000 or more inhabitants, were dumping all their untreated sewage into the Ganga every day. The Hooghly estuary was literally choked with untreated effluents discharged from 150 major units near Calcutta.

Regarding pesticides pollution, he said developed countries had already banned the use of DDT and benzene hexachloride (BHC). But these pesticides were still being widely used in India and these accounted for about 75 per cent of the total pesticides used in the country. "Residue of these compounds, both suspected carcinogens, are found in all 75 samples of breast milk collected from women in Punjab. Through their mothers' milk, babies are daily injected 21 times the amount of these chemicals considered acceptable", he said.

Mr. Oomachen said that Bombay city released every day about 500 million gallons of untreated affluent and sewage water into the sea, from which thousands of tonnes of fish were being harvested daily for human consumption. He urged the industrial units to treat their effluents, so that they would not cause environmental pollution and hazard to life.

MP RANKS SECOND AMONG MINERAL PRODUCING STATES

Madhya Pradesh ranked second among the mineral producing states of the country, with minerals worth about Rs. 1050 crores mined during 1987, it was officially stated in Bhopal.

During the period, it topped the list in the mining of diamonds, copper ore, disapore, tin, slate, byrophyllite, red ocre and limestone.

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Pollution control

As was only to be expected, participants in the all-India convention on air and water pollution, jointly organised by the National Centre for Technical Development (NCTD) and Pollution Control Boards of certain States, in Bombay underlined the need to take effective steps at all levels to control pollution to make living safer for people. As pollution control is a complex problem, it cannot be eased merely by laying down rules and regulations. Maharashtra's Minister for Transport, Mr. Vilasrao Deshmukh, stated that the State Government had passed, for example, the Environment (Protection) Act and the Air Pollution Act. If, nevertheless, he underscored the need for enlightened industrial management and self regulation, the reasons are not far to seek. The Maharashtra Government has discovered to its dismay that its attempt to enforce the Automobile Pollution Control Act has not yielded the desired results. The State Government has laid down that "the carbon monoxide content in emissions from petrol-driven engines should not exceed four per cent." Many owners of old petrol-driven vehicles tuned down their engines to obtain the requisite safety certificates. As these vehicles could not climb uphill, their owners "tuned them back to the original level while keeping pollution control certificates intact" as pointed out by the Chairman of the Karnataka Pollution Control Board, Mr. S. Hanumanth Rao. It follows that industries responsible for environmental pollution ought to honour the spirit of the law, as emphasised by the Director of NCTD, Mr. S. Narisetti. He acknowledged that "with stringent laws, many industries are now installing pollution control equipment but just to satisfy laws, maintenance of this equipment is totally neglected. There are effluent treatment plants, which are totally shut for months because of equipment failure caused by neglect of maintenance." Not surprisingly Mr. Narisetti suggested that "the pollutor should be made to pay for pollution caused by him."

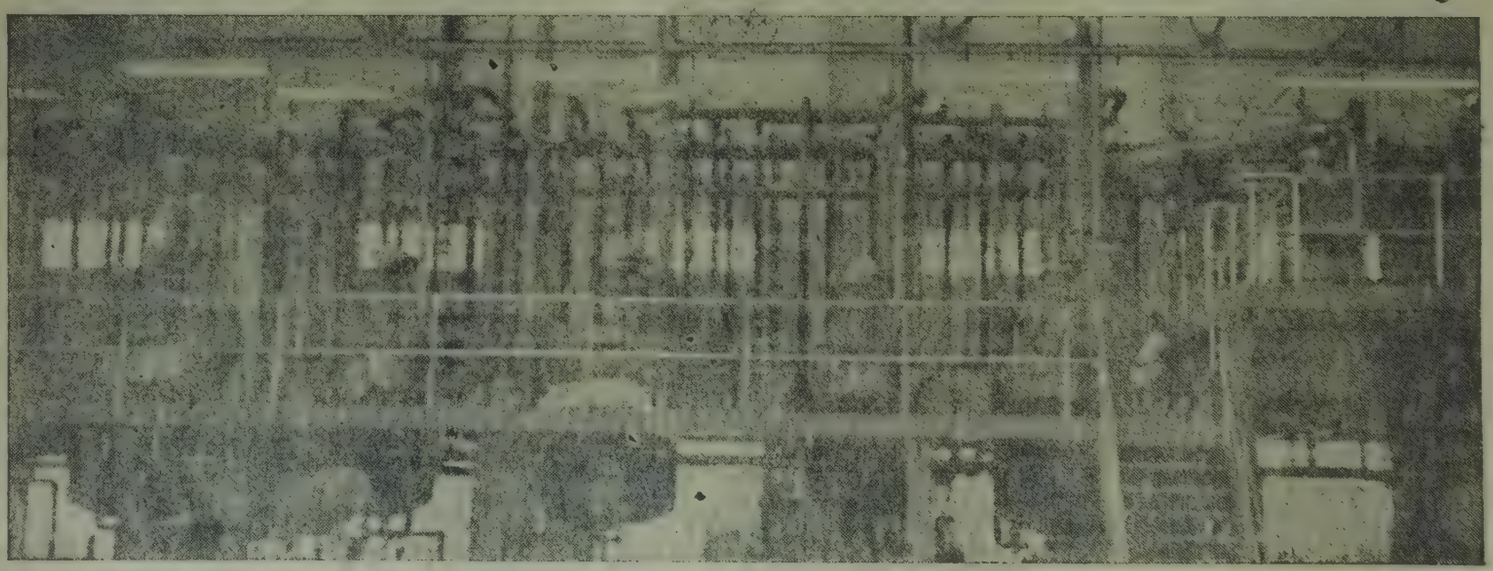
Unfortunately, this is easier said than done as State Pollution Control Boards themselves are ill-equipped to instal pollution control equipment even at the cost of pollutors. Mr. C.D. Oomachen stated htat "most of these Boards are extremely weak due to inadequate funds and lack of sufficient and well-qualified personnel." As Mr. Oomachen is the Chairman of the Maharashtra Pollution Control Board, he knows what he is talking about. The fact is that State Governments are rest content with passing laws and setting up pollution control boards. Mr. Deshmukh bemoaned that "1,700 tonnes of pollutants are discharged into the atmosphere of Greater Bombay everyday." It is not too difficult to control pollution by promoting the use of low-sulphur heavy stock (LSHS) by cotton textile mills in the city. Mills use furnace oil whose sulphur content is as high as 4 per cent against less than one per cent in the case of LSHS. Mr. Narisetti, therefore, feels that industries should substitute LSHS for furnace oil. The mill industry has, however, discovered to its chagrin that it cannot take supply of LSHS for granted. The Maharashtra Government, the mill industry and oil companies ought to come together to ensure adequate and uninterrupted supply of LSHS. It may be recalled that about a decade ago the Petroleum Ministry itself had offered incentives to mills to switch over from furnace oil to LSHS. Now, however, mills are experiencing difficulties in meeting their requirements of LSHS. They ought to be looked into without delay, considering the imperative need to curb the menace of pollution in Bombay.

— **Financial Express**

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AUTOMATIC RE-ENDORSEMENT OF LICENCES:

New scheme to boost production

The government announced a new scheme to achieve maximum industrial production. Effective from April 1, 1988, as per this scheme, the industrial licences/ registrations with technical authorities will automatically be re-endorsed with the maximum production actually achieved by the industrial undertakings in any of the financial years between April 1, 1988 and March 31, 1990.

There will be no restrictions on such re-endorsement of capacities except that the undertaking should have a valid industrial licence/registration for the item concerned and that the item should not be reserved for the small scale sector nor should it form part of the schedules iv and v of the exemption notification of February 16, 1973 issued under the provisions of the I (D/R) Act as amended from time to time.

According to a press note issued by the department of industrial development, ministry of industry, the objective of the scheme is to maximise industrial production from the existing installed capacity of plant, machinery and equipment so that the assets already installed could be put to the utmost use. It is not the purpose of the scheme to create additional capacity by making new investments in the projects already in operation. There may, however, be cases where marginal additional investments may become necessary by way of balancing equipment and debottlenecking in order to get the maximum production out of the existing plant, machinery and equipment. To take care of this possibility, additional investment, if any, in plant, machinery and equipment should not exceed 10 per cent of the existing book value of investment in plant, machinery and equipment related to that particular item of manufacture.

The scheme will apply to all industrial undertakings including MRTP/ FERA companies as also to all items regardless of whether or not they are covered by the first schedule of the I(D/R) Act. Locational restrictions will also not apply to this scheme. In case of MRTP/FERA companies, the scheme will be available to both appendix-i as well as non-appendix-i items.

If the industrial undertaking carries an export obligation in respect of the item concerned, whether in industrial licence/registration or in approvals for foreign collaboration and import of capital goods, the export obligation will equally apply to the enhanced production achieved by the undertaking under this scheme. In the event of non-fulfilment of export obligation, re-endorsement of capacity in accordance with this scheme will not be permitted.

This scheme is in addition and not a substitution of the facilities already available under any existing scheme.

EXPORT AWARD FOR HOECHST

Hoechst India has been awarded the prestigious trophy for its export performance during 1984-85 and a certificate of merit for its performance during 1983-84 by the Union ministry of commerce.

Hoechst recorded an export of Rs. 19.58 crores in 1984-85 and an export of Rs. 14.8 crores in 1983-84. The export mix of the company compriesed of finished formulations for human and veterinary use and bulk drugs to the USSR, West Germany, Sri Lanka, the U.A.E., Thailand etc.

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OIL in the sands of Jaisalmer

Oil India Limited (OIL) is hopeful of striking oil or gas this year in the desert sands of Rajasthan, close to the Indo-Pak border, reports UNI.

The first exploratory well being drilled in Jaisalmer basin has reached a depth of more than 1,500 metres. Men and machines were working round the clock at the Tanot well, located less than one kilometre from the Pakistan border, as a party of newsmen visited the site recently. The well is targetted to a depth of 3,500 metres by June next. The well was spudded on March 8 last hiring a German rig. The BSF has also established a check post at the area for security.

Oil India chairman S. Chaliha visualised good prospects in making some important discovery of hydrocarbons in Rajasthan. The company plans to drill six wells in this area as part to the first phase of exploration in Rajasthan.

The Jaisalmer basin within OIL India's petroleum exploration licence (PEL) area is an extension of the Southern Indus basin of Pakistan, were many gas fields are in production. Recently, oil was also discovered across the border in Pakistan, south west of OIL India's exploration area, according to Mr. Bujor Baruah, general manager of the Rajasthan project of OIL India.

In the Jaisalmer-Mari high, ONGC has discovered gas in two structures at Manherra-Tibba and Ghotaru and indications of presence of oil in Sadewala.

Based on available information, the prognosticated hydrocarbon reserves in OIL India's exploration areas in Rajasthan have been estimated at about 95 million tonnes. Out of this, Jaisalmer basin may have reserves of 75 million tonnes and Bikaner and Nagaur basin about 20 million tonnes. However, the commercial viability of the basin will be known only after drilling and testing of wells.

The selection of the drilling location for the first well near Tanot was done after comprehensive analysis and interpretation of the seismic data. According to Mr. C. Ratnam, director (exploration) of OIL India. The seismic surveys were conducted by a French firm from January 1985. Oil India has already completed about 8,400 line kilometres of seismic survey. A computer centre set up in Jodhpur processed the data.

The total cost of seismic survey for the project was Rs. 31 crores. The drilling of wells is estimated to cost about Rs. 51 crores in the next two years. The foreign exchange component of the Rajasthan project including seismic survey and drilling is being funded by a World Bank loan of $ 25 million.

UNPROFITABILITY LOOMS AHEAD FOR OIL INDIA

A sharp decline in its profitability of Oil India over the next couple of years on account of the increase in cost of production of oil from its ageing Assam fields, is anticipated.

The company expects a net profit of only about Rs. 30 crores in 1987-88, a decline of Rs. 20 crores from the previous year. The net profit expected in the current financial year is estimated at Rs. 14 crores, according to Mr Chaliha.

The company is expected to make only nominal profits in 1989-90, the terminal year of the Seventh Plan.

Mr. Chaliha admitted that the prospects of the company for the next two to three years are bleak on account of various factors. He told newsmen that the declining trend in profits would continue unless the government revised the basic selling prices of crude oil fixed in 1981.

Mr. Chaliha said the cost of production of oil by the company from its Assam fields had gone up tremendously in recent years. Most of the wells in Assam had to be put on artificial lifting of oil.

He said most of the new discoveries in recent years were in inaccessible areas of Arunachal Pradesh. These wells will become productive only in the early years of the Eighth Plan.

Elusive targets

Meanwhile, Oil India had failed to achieve the targets for oil production, drilling and utilisation of plan funds for the financial year just ended. Against the original target of 2.84 million tonnes of crude oil the company could produce only 2.45 million tonnes. The shortfall in drilling metreage was nearly 23 per cent. The nonutilisation of plan outlay for the year was nearly Rs. 45 crores.

Non-receipt of some capital equipments and delay in receipt and commissioning of drilling and work over rigs were the main reasons for the inability of the company to utilise the plan outlay fully, according to Mr. Chaliha.

He said the drilling performance was also affected by the departure of a large number of drilling engineers from the company during the year. Suitable steps have been taken to overcome the shortage of drilling personnel and the company hopes to achieve the crude production and drilling targets set for the current year is 2.75 million tonnes.

Oil India's performance is now being continuously reviewed by the government and steps have been taken to tone up the management of the company including shifting of the corporate headquarters from Delhi to Duliajan in Assam.

HASHMUKH SHAH TIPPED FOR IPCL TOP POST

Among the various names in circulation as prospective chief of the Indian Petrochemical Corporation Ltd. (IPCL), that of Mr. Hashmukh Shah, the present director in-charge of marketing, is most favourably tipped for the job.

According to highly placed officials of the Corporation, it would be in the interest of IPCL to fill up the post as soon as possible, in order to scorch speculations rife in the industry.

They said a pall of uncertainty has rung down on the future of the organisation since the former chief Mr. Ganguly is regarded as the architect of the phenomenal growth of IPCL in recent times.

It is pointed out that it was under Mr. Ganguly's stewardship that IPCL had successfully negotiated with the world Bank for financing the Maharashtra Gas Cracker Complex at Nagothane.

Of late, IPCL has been named the prospective joint venture partner for a number of projects like those coming up at Manali and Saleempur.

Moreover, industry insiders are of the view that Mr. Ganguly's favourable disposition towards the Haldia petrochemical project, currently in the vortex of a political controversy, has gone against him.

ONGC seeks higher price for oil

The Oil and Natural Gas Commission (ONGC) has suggested to the Government that the price paid to it for the oil it produces be increased in commercial interest.

Col (Retd) S.P. Wahi, ONGC Chairman, said on April 3, in Calcutta, that the Commission has suggested that the price of oil per tonne be hiked by at least Rs. 300.

At the moment, the Commission is earning Rs. 1,813 per tonne of oil, of which Rs. 792 returned to the Government in the shape of royalty and cess. ONGC has to operate on the strength of Rs. 1,021 per tonne, which is lower than the international price. At present, the international price is ruling around $ 18 a barrel, against the Indian price of $ 10 a barrel.

Expressing his unhappiness over the present price, Col. Wahi said the Commission has certain weightage in the nation's economy. Every year it subsidised economic operations to the tune of about Rs. 120 crores. Against this background, the Commission's proposal for a price hike is justified.

The Chairman said the Commission is shelling out every year Rs. 12 crores on account of indigenising the fleet of offshore supply vessels. Similarly, the cost being incurred on helicopters is in the region of Rs. 6 crores.

Besides, the Commission shouldered every year a hefty subsidy bill of Rs. 100 crores on account of services, contracts and materials.

The Commission is managing to cope with this demand for subsidy by increasing its profits only through increased productivity. Otherwise, it would have been difficult for it to live up to financial commitments.

Incidentally, ONGC was last allowed a price hike in 1981.

As for natural gas, Col. Wahi said the Commission is now engaged in realising the funds blocked by various public and private sector organisations consuming natural gas across the country.

To a question, he said about Rs. 700 crores has remained unrealised. Many of the consumers have gone to the court. However, ONGC is persuading them to pay and many are coming round to the idea of clearing their dues. The Commission would realise the blocked funds in the next few years.

As for gas price, he said for the developing States, especially those in the north-east, the price has been pegged at a low level, Rs. 500 per 1,000 cubic metre. For the developed States, it was between Rs. 1,500 and Rs. 1,800 per 1,000 cubic metre of gas. There is no chance of any immediate revision of the existing gas price. However, some of the north-eastern States are pressing for a lower price in the interest of quick industrialisation. Some of them are holding the view that the high price is turning off many a prospective industrial user.

To a question, ONGC Chairman said in the coming months the southern region would figure prominently in the Commission's scheme of things.

There is a possibility of making a number of small finds in the Southern States, which put together, would yield a large output.

As for the central region made up of West Bengal, Bihar and Tripura, he said it would be on the first project. A recent meeting has underscored the point that hydrocarbon prospects are quite high in the State. The Commission would intensify its efforts with aid from the USSR, to strike a find in the State. So far, an estimated Rs. 200 crores have gone into exploration. The Commission is hopeful of success. he said.

IOC ASSESSING HEALTH OF PIPELINE

The pipeline wing of Indian Oil Corporation (IOC) is now in the midst of a five year exercise to assess and monitor the health of its 3800 km long pipeline network. The survey, which is expected to help in checking any deficiency that might exist, has been adopted by using the latest techniques, namely, the Computerised Potential Logging (CPL), electrode wheel potential survey (EMP) and the Instrumented Pig Survey (IPS).

According to an IOC release, a 50-km stretch in the Asansol coal belt area of the Haldia-Barauni pipeline and a 475-km section from Allahabad to Barauni of the Barauni-Kanpur pipeline were surveyed recently by using the CPL techniques.

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SCI-ONGC joint venture likely

The petroleum ministry has agreed to the proposal of the surface transport ministry for setting up a joint venture shipping company between the Shipping Corporation of India and the Oil and Natural Gas Commission. The ministry had earlier been dragging its feet on the proposal. The joint venture would have a paid-up capital of Rs. 35 crores in which SCI will have 51 per cent share and ONGC 49 per cent. The proposed company will operate the offshore supply vessels (OSV) on behalf of ONGC.

The Shipping Corporation of India has, of late, been diversifying into offshore vessels operations. In 1984-85, the company acquired ten OSVs which were chartered by ONGC. In the last two years, SCI has bagged six contracts worth Rs. 29 crores for offshore vessels services against stiff domestic and international competition. As SCI was strenghtening its operations in this field, it was felt fit to allow it to operate 20 OSVs for ONGC. Consequently, the surface transport ministry suggested the setting up of a joint venture between the two companies especially for increasing OSV operations.

Mr. J. C. Sheth, deputy director-general, SCI, told a group of Delhi-based journalist in Bombay recently that besides increasing its share in OSV operations, the company has massive expansion and modernisation plans. The Seventh Plan provides for ordering and acquiring ships aggregating 2.6 million DWT involving an investment of Rs. 1,250 crores. With this, the SCI fleet would become younger. The average age of the fleet would decline from 11.4 years at the beginning of the Seventh Plan to 9.8 years at the end of the plan period.

Another thrust area selected by the company is upgradation of communication and information processing capabilities. The SCI had set up a new communications and computers department in July last. It has decided to acquire a mainframe computer with high speed data processing capabilities from IBM, Australia. The order for the computer has already been placed and with this SCI will have facilities of establishing data communication links with selected ships at high seas through the satellite links.

Referring to the financial performance, Mr. Sheth said that the company earned a net profit of Rs. 5.5 crores in 1986-87 against Rs. 6 crores in the previous year. This fall in profit was due to the fact that the company had to absorb an accumulated loss of Rs. 5 crores after merger with the Mugul Lines.

The company had taken a number of steps to reduce operational expenses by going in for fuel-efficient ships, scrapping of old and inefficient ships, restructuring of several liner services, tight control on manning costs through reduction in manpower and reduction in the ship procurement costs through renegotiation of several contracts with the international firms.

Mr. Sheth said that the profit of the company would have been much higher but for the huge interest burden. The debt-equity ratio of the company is 13:1 which is the highest in the public sector as a whole. The interest costs alone, worked out at Rs. 80.9 crores in 1986-87. This adverse ratio has forced the company to finance its plans through massive borrowings. The gross outlay of the company is expected to be Rs. 1,980 crores in 1987-88 of which Rs. 630 crores are from internal resources and the rest are borrowings.

The equity investment of SCI is limited to Rs. 70 crores, Mr. Sheth noted and added that the company had approached the government for increasing it to Rs. 250 crores converting loans into equity. The government loans stand at Rs. 480 crores. The surface transport ministry is not averse to the idea. It is currently having discussions with the finance minister in this regard.

FURTHER RISE IN GAS RESERVES LIKELY

The level of natural gas reserves in the country is expected to be 1,231 billion cubic metres by 1990.

The gas reserves, estimated last year, was about 1,005 billion cubic metres. The reserve had increased five fold during the past 10 years and experts feel that it may go up further.

Large reserves of gas have been discovered in the Bombay offshore, Tripura, the Krishna-Godavari basin and, to some extent, in Rajasthan and the Andaman islands. The chances of finding more in these basins were bright. Jammu and Kashmir and Himachal Pradesh were likely to join the country's growing gas map.

Natural gas can be preferentially used in place of oil in many areas. It can replace kerosene in the domestic sphere, naphtha in fertiliser plants and fuel oil and high speed diesel in the power, iron and steel and cement and ceramic industries in potential areas.

That sources pointed out that substitution by natural gas saved the country nearly Rs. 1,025 crores in foreign exchange, almost 50 per cent of the total outflow of foreign exchange. ONGC experts hope that foreign exchange savings would reach thrust on production and utilisation of natural gas.

The ONGC has successfully initiated action for conversion of its vehicles to run on compressed natural gas instead of petrol or diesel. An ONGC task force has made considerable headway in optimal utilisation of compressed natural gas in the transport sector. Successful trials by the organisation have been carried out at Rajamundry (Krishna-Godavari project), Agartala (Tripura project), Bombay and Baroda.

The sources said that ONGC had started natural gas production from Cambay at the rate of only 0.01 million cubic metres a day in 1961.

Utilisation of natural gas rose to 76 per cent in 1986-87 compared to 58.7 per cent during 1981-82. Lack of demand primarily due to delay in the creation of downstream facilities, particularly in the north-eastern sector and inadequate off-take by the committed consumers was responsible for under-utilisation of the natural gas available in the country.

However, the sources said, subsantial improvement in the utilisation of the natural gas for productive purposes was possibe following constant monitoring of the utilisation by different industries and planning systems for diverting excess gas for optimal use.

NTPC proposal finds favour with AEC: more n-power plants likely

The National Thermal Power Corporation (NTPC) has urged the Atomic Energy Commission to give preference to the southern region while setting up nuclear power plants. A letter to this effect has been written by the NTPC chief to the chief of the Atomic Energy Commission.

Disclosing this NTPC chief, Bahadur Chand said that this suggestion has been received favourably by the commission.

Thermal Plants too on anvil

The NTPC chief, who was briefing newsmen on April 9, also added that the corporation was exploring the possibility of setting up thermal power projects in the southern states. The NTPC, he said was working in close coordination with the Central Electricity Authority (CEA) for identifying coastal sites. For this purpose, the CEA had appointed RITES as a consultant to identify the least cost solution for transportation of coal to various coastal sites extending from Andhra Pradesh to Gujarat.

The corporation had, in the meanwhile, also submitted feasibility reports for projects aggregating 5950 mw to the government for processing and techno-economic appraisal and investment approvals. These included the Rihand stage II (2500 mw), Vindhyachal stage II (2500 mw), Farakka stage three (1500 mw), Chandrapur stage I (2500 mw), Manuguru stage one (2500 mw), Yamuna Nagar stage one (4210 mw) to Dadri gas project stage one (4100 and 210 smw) and additional transmission system for Vindhyachal.

The report of the first stage of the proposed super thermal power project at north Karnapura in Bihar with a capacity of 2500 mw is now under preparation and will shortly be submitted to the Union government for appraisal and investment decision.

Mr. Bahadur Chand, who is also chairman of CEA, also spoke about the prospects of exceeding the Seventh Plan target of 22,245 mw capacity generation. He said during 1987-88 itself the capacity addition stood at 4981 mw. This was the highest recorded so far in a year in the country. Earlier, a capacity of 4223 mw was added in 1985-86.

Similarly, he said, the capacity which was commisioned during the first three years of the plan stood at 11,829 mw. The balance of 10,577 mw would be commissioned in the remaining years. As a matter of fact, he explained, the total capacity addition in the Seventh Plan could actually come to 22,406 mw against 22,245 mw. This would be the first time, he said, that a 100 per cent targetted capacity addition during a plan period would not only be achieved but also exceeded. In earlier plans, the capacity addition achievement had been around 70-80 per cent of the target.

The PLF during 1987-88, he said, was the highest at 56.4 per cent, surpassing the earlier best of 55.46 per cent recorded in 1976-77. Subsequently, the PLF had started declining and slumped to as low of as 44 per cent in 1980-81. It was the result of constant efforts that the PLF had improved gradually, he explained.

The performance during the year would have been still better but for the fact that the eastern and north-eastern sectors did not perform as well. During the year, the PLF of the eastern and north eastern region was around 38.20 per cent while the PLF of the remaining three regions, northern, southern and western, came to 61.6 per cent.

Interestingly, this is the first time that the PLF of the state electricity boards (SEBs) also went above 50 per cent to touch the 53.5 per cent mark.

The NTPC whose stations recorded a plant load factor (PLF) of 75.6 per cent in 1987-88, brought about a capacity addition of 2410 mw in the year exceeding the target by 500 mw. This is nearly 61 6 per cent of the total all India thermal capacity addition of 3912 mw during 1987-88.

During the next two years of the Seventh Plan, the corporation proposes to add 1420 mw and 2630 mw, respectively. With these additions, NTPC will meet, in full the targeted capacity addition of 7360 mw during the Seventh Plan. In other words, this would constitute 43 per cent of the

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total thermal addition envisaged in the country (1770 mw) during the Seventh Plan.

With these additions NTPC's capacity at the end of the Seventh Plan would be 9560 mw, constituting about 21.8 per cent of the total anticipated thermal installed capacity (43,906 mw) in the country. During the Eighth Plan, however, NTPC has programmed a capacity addition of 9750 mw thereby raising its installed capacity to 19,310 mw, 28 per cent of the total planned installed thermal capacity of 68,795 mw in the country by then.

According to Mr. Bahadur Chand the corporation made an estimated profit of Rs. 223.92 crores during 1987-88 over Rs. 211.86 crores in the previous year. The turnover in 1987-88 increased to Rs. 842.42 crores — 29 per cent increase over the previous year's turnover.

Mr. Bahadur Chand said NTPC stations generated 19,377 million units during the year — an increase of 6.7 per cent over the target and 21.7 per cent over the previous year's generation.

The Badarpur power station, managed by NTPC, generated 3744 million units against a target of 3200 million units. The generation from this station during 1986-87 was 3314 million units. The Singrauli, Korba and Ramgundam units of NTPC achieved PLF of 82.5 per cent, 76 per cent and 77.23 per cent, respectively, during 1987-88. The PLF of the Badarpur unit was 59.25 per cent.

The NTPC chairman said the highlight of the year was that several 500 mw units were commissioned — in a single year. At Korba two 500 mw units were commissioned, ahead of schedule and the Singrauli' unit VII was commissioned two months before time.

With the commissioning of 2410 mw during 1987-88, the total installed capacity at NTPC stations is placed at 5510 mw which is about 15.5 per cent of the total installed thermal of 35,625 mw. Incidentally, as per the Seventh Plan document, a capacity addition of 6310 mw, from NTPC's central sector units, was envisaged. Later, however, following the identification of the combined cycle gas based power projects, an additional capacity of 100 mw was worked out.

In terms of operating results, Mr. P. S. Bami, director, finance of NTPC, on his part, said income from sales increased to Rs. 842.42 crores against Rs. 650.65 crores in 1986-87. The capital employed stood at Rs. 3,457 crores, registering an increase of 50.1 per cent over the previous year's figure of Rs. 2,294 crores. The return on capital employed worked out to 10.48 per cent and the return on net worth to 10.10 per cent against the norms of 10 per cent specified by the government.

Mr. Bami said that NTPC was currently, executing various projects with a total approved investment of Rs. 12,277 crores. The authorised share capital of the expenditure incurred on various projects till March 1988 came to Rs. 7,880 crores.

The budgeted outlay of Rs. 1,694 crores was fully used up by NTPC after a cut of Rs. 400 crores was effected by the government. This cut was made good by additional mobilisation of resources by augmenting internal resources from the target of Rs. 287 crores to Rs. 389 crores. This was in addition to borrowings from the PTI, Japanese banks and financial institutions.

For 1988-89, the Union government has approved a capital outlay of Rs. 2,185.34 crores which is the highest for any public sector company. The NTPC is, Mr. Bami said, becoming virtually self-dependent for its resource requirements as the net budgetary support for 1988-89 amounts to Rs. 169.52 crores working out to only 7.75 per cent of the planned outlay.

During 1988-89, the corporation's internal resource generation is expected to be around Rs 282 crores. In addition, it hopes to mobilise Rs. 500 crores through bonds, get Rs. 250 crores from the Power Finance Corporation (PFC) along with direct loans of Rs. 167 crores and external assistance of Rs. 2,827 crores.

As regards recovery of dues from the state electricity boards, it was explained that against Rs. 244.16 crores on March 31, 1987 the SEBs dues had gone up to Rs. 324 crores at the end of March 31,1988.

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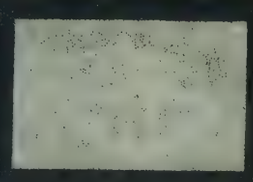
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Highlights in Chemical Technology (Part 2)

BREAKTHROUGH IN PHOTO-POLYMERIZATION BRINGS COLOUR TO ELECTROPHOTOGRAPHIC COPIERS

The black and white electrophotographic copiers may soon be replaced by colourful copiers in business and industry due to a recent breakthrough in photomerization by Mead Imaging Division of Mead Inc of Dayton, Ohio, U.S.A. The new breakthrough will bring colour to business communications in U.S.A.

Last December, Mead unveiled an improved microcapsule technology that will produce high quality images. Mead Imaging Division also has lined up 6 hardware partners (including 5 Japanese companies) who are preparing to launch a variety of products in 1988-89, including colour copiers, 35 mm slide printer, colour computer printers and colour hard copy devices for electronic cameras (refer Table 1 below). All these products will rely on Mead's cycolour media.

Mead by late 1988, plans a $40 million plant to make its microcapsule-coated media for sale directly to its hardware producers.

This new technology has some tools for simple and economical quality colour pictures, colour diagrams, colour charts and graphs in everyday business communications.

Cycolour is photographic-like colour film technology that does not rely on silver halide, but is sensitive to visible light. Cycolour film is made of polyethylene terephthalate coated with a single layer of photosensitive, colour-selective, dye-filled microcapsules called 'cyliths'. When exposed to light and the proper filters, a latent image is produced on the film. The image is much like a negative in conventional photography. The latent image is actually a pattern of hard, polymerized, exposed cyliths and soft, unexposed cyliths.

In the development step, the Cycolour film and the coated paper or transparency are compressed through pressure rollers. The tiny, unexposed cyliths release oily dyes to the Cycolour paper or transparency. The dyes react with a proprietary coating on the paper or transparency to produce a colour image.

In the final step, the Cycolour paper or transparency is briefly heated to enhance the quality of the colour reproduction. The cylith permits a liquid reaction to be carried out in such a manner that, to users, it is clean and dry. The company is very secretive about the composition of its dyes, but it has revealed briefly that its cyliths —which are 5 microns in diameter on average — contain a liquid monomer, in which is dissolved a light-sensitive photo initiator and a colour forming substance called a leuco dye, which takes on colour only after exposure to light and the proper photo-initiator.

The process achieves full colour by mixing three different types of cyliths, which contain either cyan, magenta or yellow leuco dye along with the photo-initiators sensitive to red, green or blue light, respectively.

For example, in Mead's process, when reproducing a scene with a lot of green in it, the green images fall through a filter onto a cylith coating, selectively exposing the green-sensitive cyliths in the same pattern of green on the original. The red and blue-sensitive cyliths on those segments are not affected. The cyliths that are sensitive to green light contain a dye that produces a magenta colour. They are polymerized, hardening the capsule so that it cannot spill its contents. Thus, when the sheet passes through pressure rollers, no magenta dye is formed. Only cyan and yellow dyes are formed, making green.

Likewise, blue light controls the yellow dye and red light controls the cyan dye. Exposure to all cyliths using white light results in no colour on the white paper, and exposure to no cyliths results in black. By control-

Table-1
Mead Imagings Hardware Partners

Companies	Colour-based Hardware
Brother Industries (Nagoya, Japan)	
Dainippon Screen Mfg. (Kyoto, Japan)	Colour Computer Printer
Greyhawk Systems (Malpitao, Calif)	Display laser addressed imaging systems
Noritsu Koki (Wakayama, Japan)	35 mm slide printer
Seiko Epson (Suwa City, Japan)	Colour copiers
Seiko Instruments (Tokyo, Japan)	Colour copiers

ling the relative proportion of the three dyes, any colour can be reproduced.

The development of visible photoinitiators by Meads scientists in 1986, made possible the breakthrough. Prior to 1985, the only chemistry known to produce photoinitiation of the material efficiency required U.V. light.

The company is confident that its new technology in photo-copying will make colour copiers cheap and economical for extensive office use in the coming years. (*Chem Wk.*, 12/23/87, pp. 32-33)

HABER GOLD PROCESS GETS ITS FIRST FIELD TRIAL

The first gold to be produced using the proprietary Haber Gold Process has been reported at Haber's Inc's, small gold mill at Timbstone, Arizona. It was the first time the process has been employed to treat large quantities of gold ore under field conditions.

The process first announced in 1984 has been described by Norman Haber as a process developed by him and the company researcher John Lee based on his discovery of a hitherto unknown chemistry for solubilizing gold. If claims for the process bear out, there are number of benefits.

The company reports, for example, that the process is non-toxic (conventional technology for low-grade gold ore typically uses sodium cyanides). According to the company, the gold processed by the new technique involved extraction after a four hour treatment time, of 96% of the gold contained in 55 tons of ore and concentrates — consistent with lab and pilot tests and showing improved efficiences over conventional 48-hour cyanide extraction. (*C & EN.*, 10/12/87, p. 16); (*C & EN.*, 2/6/87, p. 5)

A THERMO-CHEMICAL LIQUEFACTION PROCESS TURNS SEWAGE INTO OIL

A pilot plant for converting sewage sludge into fuel oil will be designed, built and demonstrated by Battelle Pacific Northwest Laboratories under an $850,000 research project sponsored by American Fuel and Power Corp (Panama City, Florida).

The project will take advantage of Battelle research on the process which works by concentrating the primary sludge and mixing the 20% solids residue with alkali. The mixture is then heated under pressure to convert the organic fraction to a crude oil. The oil will then be upgraded using American Fuel & Power Technology to produce a fuel oil with characteristics, such as viscosity, that are needed for commercial acceptance. The continuous thermo chemical liquefaction process used for converting the sludge reduces sludge volume and produces more energy than is consumed during disposal, according to Battelle project manager Alex G Fassbenda. (*C & EN.*, 9/28/87, p. 20)

DRINKING WATER MADE FROM SEAWATER USING THERMAL ENERGY FROM THE OCEAN

Fresh water suitable for drinking or crops has been made from seawater using thermal energy from the ocean. Engineers from the Argonne National Laboratory and the Solar Energy Research Institute (SERI), working on a joint research project on ocean thermal energy conversion (OTEC) at the Natural Energy Laboratory in Hawaii, produced 6 gal a minute of fresh water in a recent experiment.

The project's goal is to develop OTEC power plants that can supply both electricity and fresh water to island communities. In such a plant, warm water from the surface of the ocean would be drawn into a low-pressure chamber, where it would flash to steam to drive a turbine that generates electricity. As was demonstrated for the first time in the Argonne/SERI experiment, the steam, then can be condensed into fresh water by cooling it with colder seawater pumped from half a mile below the surface. (*C & EN.*, 10/19/87, p. 29)

ADVANCED COAL GASIFICATION CONCEPT UNDER DEVELOPMENT FUNDED BY DOE (U.S.A.)

Development on a so called 'multi-solid fluidized bed' coal gasification process will begin at Battelle's Columbus Div. under a two year contract to the Dept of Energy (DOE) U.S.A. Representing a new generation of coal gasification concepts, the approach employs two vessels. One serves as a heat producing combustor, burning coal char in a suspended bed of dense materials such as gravel. The dense matter retards the movement of lighter char particles long enough for them to be heated to 1200 to 1800 degree F. Ultimately, however, the hot particles are swept out of the bed and into the second vessel, where they encounter fresh coal and transfer their heat. Coal is gasified with steam in the second vessel, producing a medium—Btu gas and residual char. (*C & EN.*, 10/19/87, p. 29)

JAPAN UNVEILS SUNFLOWER MILK

Sumitomo Chemical Co. of Japan has recently patented its process to produce milk from confectionary sunflower seeds in several countries, including the U.S.A. The sunflower seed milk is reported to taste

remarkably like cow's milk. There is none of the beany flavour usually associated with these kinds of products. Therefore, this product could be a viable product in infant milk formulations and milk substitutes.

The process for producing sunflower seed milk is in many ways similar to that used to make soyamilk. According to Yishi Takashima, Planning & Commercial Development Manager of Sumitomo Chemical America Inc, the Sumitomo process has overcome the problem of the presence of chromogenic acid, which could give the product a green colour. Takashima reports that the company has produced yogurt-flavoured and malt-flavoured sunflower seed milk. (*JAOCS*, 2/1987, p. 128)

A PROTOTYPE PLANT FOR GUAYULE RUBBER TO START OPERATION IN 1988

Construction is under way for a prototype plant to extract natural rubber from guayule, a desert shrub. The plant is a joint venture of USDA and the Defence Dept. and will be built and operated by Firestone Tyre & Rubber Co. Located on the Gila River Indian Reservation near Phoenix, Arizona, the prototype plant will use a solvent extraction process to recover the rubber from shrubs grown nearby. It will have a capacity of 150 tons per year and employ about 25 people. Part of the rubber from the plant will be tested for military application, primarily tyres. The USDA will use the remaining rubber and by-products to promote commercial development of the shrub. Operation is scheduled to begin in early 1988. (*C & EN.*, 4/3/87, p. 30)

ABAR IPSEN UNVEILS REACTOR FOR FUEL CELL FABRICATION

A reactor for electrochemical vapor deposition (EVD) has been developed recently by Abar Ipsen Industries in conjunction with Westinghouse Electric Corp. for use in manufacturing solid oxide fuel cells (SOFC). The $1 million plus unit is the first of three to be installed at Westinghouse's new SOFC facility in Monroeville, Pa, U.S.A.

SOFCs are cylinders measuring about 13 mm in diameter and ranging in length from 0.2 to 1 m. EVD is used in two of fuel cell fabrication steps that basically involve coating aluminium oxide with a variety of ceramic layers; deposition of the solid electrolyte and fixing of the fuel electrode.

The Abar Ipsen reactor is reported to be the first of its kind based on vacuum furnace technology. The unit will automatically process batches of as many as 60 fuel cells. Incidentally, fuel cells, including solid oxide types, generate electricity by direct conversion of chemical energy into electricity. In addition to being efficient, the method also is non-polluting (reaction products are water and carbon dioxide), quiet and reliable, air-cooled and relatively simple. It is estimated that fuel cells will supply 7-8% of all electric power by the year 2000 AD in U.S.A. (*Ceramic Ind.*, 2/1988, p. 13)

MANY NEW APPLICATIONS FOR BORON CARBIDE ON THE HORIZON

Boron Carbide (B_4C) is one of the hardest material in ceramics. Only diamond and cubic boron nitride are harder than boron carbide. The ceramic also boasts a flexural strength of 275 M Pa and a compressive strength of 2855 M Pa. To optimize strength, corrosion resistance and melting point of boron carbide components, the material should be formed by hot pressing or cold pressing and sintering. However, to optimize density, very fine powder and special processing are needed.

Abrasion resistant applications for this very hard, highly heat resistant ceramic include spray nozzles, bearing liners and furnace parts. In the nuclear energy field,B_4C is selected for reactor control elements, radiation shields and moderators.

Three grades of boron carbide are commonly available in advanced countries: technical (67 to 70% B); bulk density, (1.8 to 2.3 g/cm^3), high purity (75 to 80% B; hot pressed bulk density, 2.4 to 2.5 g/cm^3) and nuclear (76.5% B min). (*Ceramic Ind.*, 2/1988, p. 518)

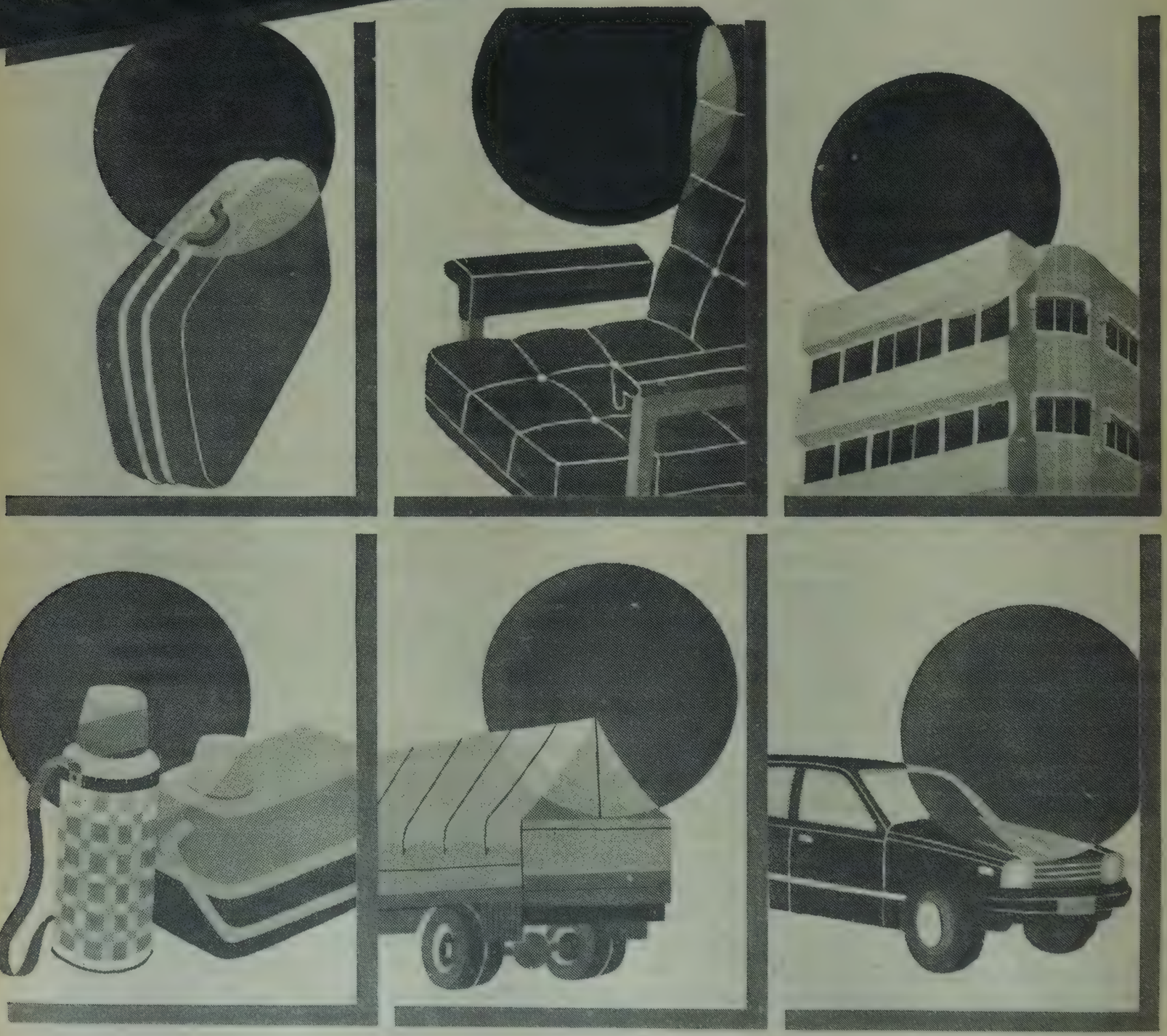
FDA APPROVES A CHLOROFLUOROCARBON (CFC) SUBSTITUTE DEVELOPED BY DU PONT

The first chlorofluorocarbon substitute coming on the market after last September's historic agreement by 45 nations to cut ozone-depleting CFC by 50% by 1999 will be Formacel, the proprietary CFC substitute developed by Du Pont and approved by FDA in February1988.

Formacel (abbreviated as HCFC) is a proprietary CFC substitute from Du Pont that is reported as 95% more ozone-protective then CFC 12. The hydrogen atom in HCFC, which also contains chlorine, fluorine and carbon atoms, makes the compound less stable and results in its breakdown before it reaches the stratosphere.

Incidentally, Du Pont has been marketing HCFC for 40 years as a refrigerant, but the product has not been used before in foam blown packaging because it is more expensive than CFC 12. (*Chem. Eng.*, 2/15/88, p. 19); (*Chem. Eng.*,1/18/88, p. 22).

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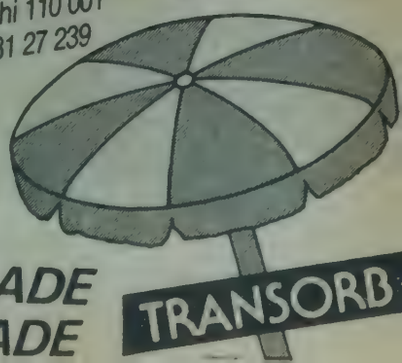
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(Continued from the previous issue)

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Androstenolone
Androstenedione
Anti-corrosive agents (other than ethylene diamine)
Antimony metal
Antimony oxide
Argon gas
Azo-ribitylamine
Ball Clay
Barbitol
Battery depolarized chemical of gamma variety
4:4 Benzidine, 2:2 disulphonic acid
Benzophenone
Benzoyl peroxide
Benzoyl J-acid/salt
Benzyl cyanide
Betahydroxy naphthoic acid (BON acid)
Betamethasone and its salts
Beta naphthylamine
Bis (4,5-butyl cyclohexyl) peroxydicarbonate
Bismuth
Bismuth oxide
Bisphenol-A
Bleaching Earth
Bleaching powder and hypochlorites
Bromine
Bronidiol (2-Bromo-2-nitro propane-1-3-Dion)
1-4-butandiol dimethacrylate
Butadiene
Butynediol
Butanol (secondary and tertiary)
Butylated hydroxy anisole
C. acid (2-chloro-5-toluidine-4-sulphonic acid) and its salts.
Calamine
Calcium boride
Calcium citrate
Calcium silicide
Calcium gluconate, injectable grade
Calcium manganese silicon alloys
Capacitor fluids (non-PCB type)
Carbon black (for printing ink, paint, and carbon paper manufacturers only)
Carbon black (channel black & lamp black)
Carbon electrode paste (Soderberg paste)
3-Carboxy-1-(p-sulphophenyl 5-pyrazolone)
Casein based glazings and dressings for leather finishing
Catalysts (other than those mentioned in Limited Permissible Items)
Cellulose acetate butyrate resin/-moulding powder
Cellulose acetate flakes/powder/-strips
Cellulose acetate/nitrate sheets
Cellulose powder including microcrystalline cellulose powder
Cephalexin
Ceramic dielectric powder (barium titanate based ceramic composition)
Chicago acid/salt
Chloramphenicol stearate and chloramphenicol sodium succinate
Chlorhexidine base
Chlorodimethoxy benzene
Chloro-dimethoxy nitro benzene
3-Chloro-4-methoxyphenyl isocyanate
Chlorinated rubber
2-(2-Chloro-N-methylacetamide)-5-chlorbenzo phenate
2-Chloro-2,6-diethyl-N-methyl acetanilide (azomethane)
Chloro para nitro toluene
Chloro para amino toluene
Chlorpheniramine maleate
Chloroquin sulphate
Chrome ore
Cobalt oxide
Cocoamine
Coal tar pitch
Colloidal graphite
Condensor insulating and impregnating oils
Colloidal and fumed silica
Copolymers of styrene and maleic anhydride
Copper cyanide
Cortisone acetate
Cotton linters
Cumidine isocyanate
Cyanuric chloride
Cyclohexane

Cyclohexanone
Cyclobarbitol
4-Cyanopyridine
Dipropylene glycol
DHA acetate
16-DPA
Desulphurising compound (based on calcium carbide)
Dexamethasone
Dextran
Dextroamphetamine and its salts
Diatomaceus earth (DE)
3,4 Diamino benzophenone
1:5 Dibenzoyl naphthalene
Dicalcium phosphate
2:4 Dichloro benzoic acid
2,4 Dichloro benzoyl chloride
2,4 Dichloro toluene
Dicyandiamide
Diethylene glycol (bis) allyl carbonate
Dicumyl peroxide
Dibutyl maleate
Diethylene triamine pentaacetic acid
Diethylsulphate
Diiso butylene
Diisobutyl ketone
Di-J-acid/salt (Rhoduline acid/salt)
Dimenhydrinate
Dimethyl acetamide
2:5 Dimethyl-4-chlorophenyl thioglycolic acid
Dimethyl chloro-tetracycline
2:5 Dimethoxy aniline
2:5 Dimethoxy nitro benzene
3-Dimethylamine
Dimethyl sulfoxide
Dioxyazine
Diphenhydramine hydrochloride
Dichloro acetic acid
Distearyl dimethyl ammonium dichloride
Ditertiary butyl meta cresol
Divinyl benzene monomer
Drugs/drugs intermediates not elsewhere specified
Dyes/dyestuffs/organic pigments and colours, not elsewhere specified
Ethyl chloroformate
Ethyl glycol
2-Ethyl hexanoic acid (Octoic acid)
Electrolytic manganese dioxide
Empty hard gelatine capsules
Ephedrine hydrochloride
Epoxy/epoxide moulding compounds
Terpene indene resin/polyterpene resin
Coumarone indene resin
Epoxy plasticizers
Erythromycin ethyl succinate
Estradiol benzoate
Estrone
Etching chemicals i.e. additive filming agents for "Printing Units Only"
Ethinyl estradiol
Ethisterone
Ethoxymethylene malonic acid ester (EMME)
Ethyl cellulose
Ethylene brassylate
Ethylene diamine tetra-2-propanol
Ethyl benzene
Ethyl methacrylate
Ethylene maleic anhydride copolymer
Ethylene vinyl acetate (granules)
Ethyl monochloro acetate
Ethyl silicate
Ethyl thio ethanol
Ethyl phenyl cyanoacetic ether
Ethyl phenyl malonic ester
Eucalyptus gum chips
Fat liquors
Flange sealants
Flame proofing chemical having diammonium hydrogen phosphate as base (35-40%)
Flocculating agents based on poly acrylamide (dispex)
Fluoboric acid
Fluorescent pigments
Fluorspar (other than acid grade)
Frusemide (furosemide)
Furfuralamine
G. salt
Gamma ferric oxide
Fullers earth
Gamma acid/salt
Geranium oil
Glues consisting of a mixture of rubber organic solvents, fillers, vulcanising agents and resins
Glutethimide
Glycerine
Griseofulvin
Gum rosin
H. acid/salt
Halothane including halothane in bottles
Heat transfer oil (synthetic)
Helium gases
Hexabromo cyclododecane
Hexachloroethane
High density alumina grinding media
Hydrocortisone
Hydrocortisone acetate
Hydrogen peroxide
Hydroxy ethyl acrylate
2H 4MS (2 Hydroxy-4-methoxy benzophenone -5 sulphonic acid)
8-Hydroxyquinoline
Hydroxy-2,4,4 trichlorodiphenyl ether
Hydroxy propyl methyl cellulose
Iodine
Indomethacin
Iron oxide black colour C.I. No. 77499
Insecticides, pesticides and weedicides, the following:
- Acephate
- Alachlor
- Aldicarb
- Aldrin
- Atrazin
- Allethrin
- Benomyl
- Calcium cyanide
- Captafol
- Captan
- Carbofuran
- Carboxin
- Chlordane
- Chlorfenvinphos
- Chlorbenzilate
- Chlorpyriphos
- Dalapon
- Diazinon
- D.D. mixture
- Dicofol
- Diflubenzuron
- Dinocap
- Dithianon
- Edifenphos
- Ethepon
- Ethylene dibromide
- Formothion
- Glyphosate
- Heptachlor

- Kitazin
- Maleic hydrazide
- MCPA
- Menazon
- Mancozeb
- Methyl bromide
- MSMA
- PCNS
- Pendimethanil
- Phenthoate
- Pyrimiphos methyl
- Propanil
- Propoxur
- Simazine
- Sirmate
- Temephos
- Tetradifon
- Triallate
- Trichlorphon
- Tridemorph
- Thiometon

Insecticides, registered for import under the Insecticides Act, other than those elsewhere specified
Inositol
Insulating oils (synthetic) including chlorinated diphenyl other than transformer oil synthetic
Ionone alpha
Isoamyl alcohol
Isobornyl acetate
Isobutyl acetate
Isobutyl benzene
Isobutyl methacrylate
Iso-octane
Isopropyl alcohol
Isopropyl chloroformate
Isophorone
Isopropyl ether
Isopropyl-methyl oxypyrimidine
J-acid/salt
J-acid urea/salt
Kanamycin
Lacquers and varnishes including emulsions thereof
Lasamide (2,4 dichloro-5-sulphamoyl benzoic acid)
Laurents acid
L. base (aminodiols)
Lithopone
Levamisole HCl
Lustre colour
Magnesium carbonate, light
Magnesium oxide, light
Mandelamin
Mandelic acid
Manganese dioxide chemical synthetic/monda grade/natural
Manganese oxide chemical/synthetic/monda grade
Manganese sulphide
Magnesium powder
Maleic anhydride
Mebavarine hydrochloride
Mephenesin (glyceryl ortho cresyl ether)
Mercury/mercury ammoniated
Metachloro aniline
Meta nitrobenzene sulphonic acid
Meta nitro chloro benzene
Meta phenoxy benzaldehyde
Metallic acetates
Meta substituted alkyl phenols (carbinol)
Methacrylic acid
Methamphetamine
Methyl anthranilite
Methyl bromide
Methyl cellulose
Methyl chlorosilanes, such as:
- Dimethyl dichlorosilane
- Methyl trichlorosilane
- Trimethyl chlorosilane
- Octamethyl cyclo tetrasiloxanes
- Hexamethyl disiloxane

Methyl dichloro acetate
Methyl ethyl pyridine
Methyl ethyl ketone
Methyl formate
Methyl isobutyl ketone
4-Methyl-5-thiazole-ethanol
Methylene dianiline
Metol
Misch metal
Molasses
Molecular sieves
Molybdenum based greases and lubricants
Monoethylene glycol
Musk ketone
Musk xylol
Naphtha (solvent grade)
Naphthalene crude
Naphthenic acid
N-hexane
N-heptane
2-Naphthyl thioglycolic acid
Natural essential oils
N,N Diethyl aniline
N-Methyl morpholine
N-Methyl-2-pyrolidone
N-butyl methacrylate monomer
N-butyl methacrylate
N-P (beta 2 methoxy 5 chloro benzmide ethyl) phenyl sulphenyl urea
Natural cryolite
Nikethamide
Nitrazepam
Nitric acid
4-Nitro, 2-amino phenol
Normal pentane
Nux vomica bark
Nylon 66 moulding powder having melting point 260°C
N.W. acid/salt
Octyl dimethyl para amino benzoic acid
Oestradiol
20% Oil treated sulphur, including crystex/insoluble sulphur
Oleo gum resin
Optical whitening agents
Organic surface active agents (other than soap) and also excluding those mentioned in Limited Permissible Items
Ortho amino phenol
Ortho chloro aniline
Ortho-chloro 1-(4-sulphophenyl)-3-methyl-3-pyrazolone
Orthochloro para nitro aniline
Ortho chloro phenol
Ortho dianisidine
Ortho phenetidine
Oxytocin
Ortho tolidine dihydrochloride base
p-Aminobenzyl glutamic acid
p-Chloro benzyl cyanide
Panthenols
Para amino azo benzene
Para amino benzoic acid
Para chloro aniline
Para chloro benzoic acid
p-Chloro benzone sulphenyl urea
Para chloro benzyl cyanide
Para chloro metacresol
Para chloro ortho nitro aniline
Para chloro phenol
Para chloro toluene
Para cresyl phenyl acetate
Paraffinic/naphthenic/aromatic

rubber plasticizers
Para hydroxy benzoic acid
Paraldehyde
Para nitro aniline
Para nitro anisole
Para phenylene diamine
Para nitro benzoic acid
Para tertiary butyl phenol
Para toluene sulphonyl chloride
Para toluidine meta sulphonic acid (PTMS)
Para toluidine-5-sulphonic acid and its salts
1-(p-Sulphophenyl)-3-methyl-5-pyrazolone
Pentabarbitol
Perchloro ethylene
Perlite ore/mineral
Pethidine hydrochloride
Peri acid/salt
Phenetoin sodium and diphenyl hydantoin
Phenol
Pheniramine maleate
Phenol formaldehyde resinous tubes
Phenol formladehyde moulding powder (electrical grade)
Urea formaldehyde moulding powder (electrical grade)
Melamine formaldehyde moulding powder (electrical grade)
Phenoxy acetic acid and its salts
Phenyl hydrazine
Phenyl J. acid/salt
Phenyl peri acids/salt
Phosphorous acid
Phosphorous (red)
Phosphorous pentasulphide
Phosphorous trichloride
Phosphoric acid (industrial/non industrial grade)
Picoline, beta and gamma
Pigment finishes for leather
Piperazine (diethylene diamine) anhydrous hexahydrate
Poly aluminium chloride
Polycarbonate moulding powder/-granules
Polycarbonate (thermoplastic raw materials
Polyethylene resin/moulding powder granules (all grades)
Polyethylene wax
Polymethyl methacrylate moulding pellets (acrylic pellets)
Polyol
Polypropylene
Polypropylene fibre/tow
Polypropylene wax
Polystyrene film
Polystyrene resin/granules/moulding powder
Polyvinyl acetate/acrylate and co-polymers (excluding emulsions)
Polyvinyl alcohol
Polyvinyl butyral resin sheets
Polyvinyl pyrolidone
Polyvinyl pyrolidene powder or solution
Potassium chlorate
Potassium bromide (phtographic grade)
Potassium compounds, the following:
- Potassium bicarbonate
- Potassium fluoborate
- Potassium fluoride AR and technical grade
- Potassium meta bisulphite
- Potassium silicate
- Potassium titanium fluorite
- Potassium ferro cyanide
- Potassium nitrate
- Potassium persulphate
- Potassium peroxomono sulphate
- Potassium pyro antimonate

Prednisolone
Prednisone
Pregnenolone
Primidone
Procaine hydrochloride
Propargyl alcohol
Propantheline bromide
Propylene trimer/tetramer
Propylamine-1
Propane
PVC compounds for manufacture of gramophone records
PVC resins
PVC separators
Pure ortho or pure para or pure meta cresols (both chemical and technical grades) each of purity not less than 97%.
High boiling tar acids and creosote oil having boiling range about 220°C
Pyrental pamoate
Pyridine
Rare earth oxide including rutile sand (for actual users on Production of recommendation from Dept. of Atomic Energy)
Rangolite C, sodium sulphoxylate formaldehyde
Ribitylamine
Rose crystals (trichloro methyl phenyl carbinyl acetate)
Rubber chemicals such as accelerators, curing agents, anti-oxidants, retarders, peptisers and reclaiming agents (except those mentioned in Limited Permissible Items)
Salicylic acid including sodium salicylate
Schaeffer's acid/salt
Secobarbitone
Secondary butyl benzene
Secobarbitone sodium
Silicon carbide grains
Silicon carbide graphite crucible size over 100 and carbon bonded graphite crucibles
Silicone compounds/fluids/oils/resins (excluding chlorosilanes)
Silver brazing flux (potassium florure and potassium tetrafluorate)
Silver brazing powder (silver 20%, copper 39%, zinc 29%, cadmium 12%
Silver cyanide
Soda ash
Sodium alginate (dental grade)
Sodium bromide
Sodium chlorate
Sodium chlorite
Sodium fluoride
Sodium hyposulphite
Sodium metal antimonate
Sodium methoxide
Sodium nitrilotriacetate
Sodium oleo stearate
Sodium monofluoro phosphate
Sodium perchlorate
Sodium salt - oxal acetic ester/oxal acetic ester/oxal acetic ester sodium salt
Sodium salt of methyl naphthalene sulphate
Sodium sulphate
Sodium tetra silicate

Solvents
Solvent naphtha
Soya lecithin
Special calibration gases
Stearmidopropyl dimethyl -beta-hydroxyethyl ammonium nitrate
Styrene/styrene monomer
Succinic acid
Succinyl chloride
Succinyl succinate
Sulphadimethoxine
Sulphafurazole
Sulphamethoxypyridazine
Synthetic bleaching agents (other than bleaching powder or hypo chlorites)
Synthetic ion exchange resins except cation exchange resins
Synthetic organic tanning agents
Synthetic pyrethrum (including synthetic pyrethroids other than decamethrin, permethrin, cypermethrin, fenvalerate)
Synthetic red oxide and Persian Gulf
Synthetic rubber other than those mentioned in Limited Permissible Items
Synthetic yellow iron oxide
Tartaric acid
Terbutaline sulphate
Tertiary butyl hydro quinone
Tertiary butyl per benzoate
Tetra chloroethane
Tetra sodium pyrophosphate and polyphosphates of sodium
Theophyllines
Thiazole/thiazole guanidine derivatives
Thionyl chloride
Thioglycolic acid
Thiuram derivatives
Thymol
Titanium sponge
Titanium tetrachloride
TIOC (erythromycin thiocyanate)
Tobias acid/salt
Toluene di-isocyanate
Trialkyl phosphate
Triaryl phosphate
Trichloromono fluoromethane (fluorocarbon refrigerant H), dichlorodifluoromethane (fluorocarbon refrigerant-12), dichloromonofluoro methane (fluorocarbon refrigerant-21), mono chlorodifluoro methane (fluorocarbon refrigerant-22), and mixtures thereof
2,2,4-Trimethyl-1,3-pentane diol, di-isobutyrate
Triethanolamine titanate and isopropyl titanate
Trimethyl phosphite
3,4,5-Trimethoxy benzaldehyde
Tris hydroxy methylamine methane
Tris nonyl phenyl phosphite
Tungsten salts
Turpentine oil
Unsaturated alcohols (C_{16} to C_{18})
Vanillin/ethyl vanillin (including mixed lignin aldehyde)
Vitamin P (Rutin)
Wax emulsions
Wood pulp (nitro cellulose grade)
Wool grease
Xylenols
Zinc cyanide
Zirconium silicate and zirconium opacifiers including zirconium fluor, zirconium powder and getter powder

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LACTOSE BP/USP
PENTAERYTHRITOL
SODIUM FORMATE
BASIC CHROME SULPHATE
SODIUM BICHROMATE
EPHEDRINE HCL/PSEUDO
THEOPHYLLINE ANHYDROUS
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COPPER CHROMATE
COPPER ACETATE
COPPER NITRATE
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SODIUM BITARTARATE
&
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Please Contact Manufacturers For Competitive Prices:

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10, Kotkar Industrial Estate, Off: Aarey Road, Goregaon (East), Bombay - 400 063
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Resi.: 625735

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6 BROMO 2,4 DI NITRO ANILINE
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Contact Manufacturers:

DIVYA CHEMICALS

Room No. 8, 'C' Block, 2nd floor, Bhangwadi,
Kalbadevi Road, BOMBAY - 400 002
Phone: 311199/253616/297052/310112 Gram: DIVYACHEM, BOMBAY-400 002

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P. K. R. Dorairaj Nadar Compound,
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Phone: 752

M/s. THIRUMAGAL AGENCY
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Sivakasi-626 123.

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378/80, Narshi Natha Street, Bombay - 400 009
Phone: Off: 343314, 331864 Res: VIRESH MEHTA 5617578
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DIETHANOLAMINE
CELLOSOLVE
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METHYL CELLOSOLVE
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BUTYL CARBITOL
GLYCINE
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DI SODIUM EDTA
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PEG 4000
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Vimal Udyog Bhavan, 6-A, 2nd Floor, Manorama Nagarkar Marg,
Opp. Badal-Bijali, Mahim, Bombay 400 016
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Office: 12/2679, Dr. Kavina Street, Sayed Pura, Surat. **Phone: 36514**

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Please Contact the Manufacturers:

Mr. VIKAS SANDU

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Phone: 528712

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Contact Manufacturers :—

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6, Ashakunj Society, Nr. N.I.D., P. Box 12001, Paldi, Ahmedabad-380 007.
Cable : CHEMENGERS
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Jambli Naka, Thane-400 601
Phone : 503593

Factory :
Plot No. 5903/1, GIDC
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Phone : 2938

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2, Anand Nagar Society, Jetalpur Road, BARODA 390 005.
Phone: 323985 Telex: 0175-423 Gram: INDIA BORAX

080288 TV ADS

COMPANY NOTES

Gujarat Heavy Chemicals Ltd

Gujarat Heavy Chemicals Ltd., the largest joint sector project in the country, has been promoted by Gujarat Industrial Investment Corporation Ltd. (GIIC) and DALMIAS for setting up SODA ASH manufacturing facilities at Sutrapada, District Junagadh on the Saurashtra coast of Gujarat. The project involves a capital outlay Rs. 246 crores (Rs. 2460 million) and will have an installed capacity of 1200 tonnes per day.

Promoters

In its promoters, GIIC and DALMIAS, GHCL combines the best of both worlds — the public and the private sectors.

The state sector promoter, GIIC, has spearheaded Gujarat's phenomenal industrial development, both as financier and promoter, for almost 20 years. It has the reputation for promotion of several highly successful ventures in Gujarat which has helped to take the State from 8th position to the 2nd most industrialised State in the country in just a decade.

The private promoters are the DALMIAS through GTC Industries Ltd., Dalmia Dairy Industries Ltd. and others. For Dalmias, this project is in keeping with their diversification programme — from fertilisers, textiles, cigarettes, dairy products, explosives, paper and television software to telecommunication hardware, staple fibre, tourist resorts and now heavy chemicals — covering a broad industry segment which has taken the combined turnover of DALMIA companies from Rs. 50 crores in 1975 to Rs. 300 crores in 1985 and is now targetted to cross Rs. 500 crores by 1988.

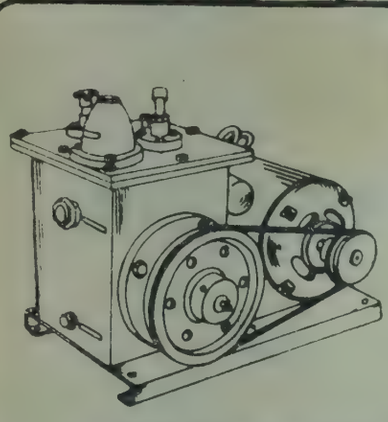
Foreign Collaborators

The technology for this project is undoubtedly the world's best and is coming to India for the first time. The collaborators are Akzo Zout Chemie bv of the Netherlands and Klockner Industrie Anlagen of West Germany — two international giants with a wealth of experience and expertise.

Akzo

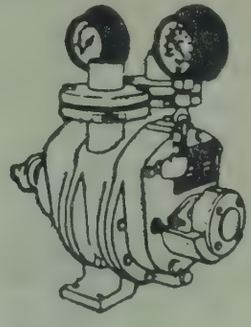
Akzo Zout Chemie is a member of the giant Akzo group. Turnover of the group in 1985 was over Rs. 9,900 crores with 225 operations in 50 countries. The Group's product range includes man-made fibres, salt, commodity and speciality chemicals, coatings, pharmaceuticals and diagnostics, consumer products, machinery, engineering plastics, membranes and industrial products divided in seven distinct operational groups. In chemicals alone, Akzo manufactures over 4000 different products.

Akzo has been in Soda Ash operations for nearly three decades, and has developed proprie-

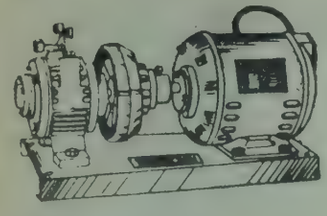


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tory technology for the manufacture of the product which is far ahead of the technology currently available in the country.

Klockner

Klockner Industrie Anlagen is one of the giant international groups with a diversified range of interests — from international procurement, engineering, consultancy, financial engineering to counter trade, management training and operational assistance. With offices in 55 countries and a sales turnover of Rs. 12,000 crores annually, the name Klockner today signifies tradition, reputation and reliability. Klockner now joins hands with Akzo in the supply of critical equipment for the GHCL plant.

Technology

AKZO has developed a revolutionary technology for Soda Ash production which has been successfully tried at their own facilities in the Netherlands. The main advantages of Akzo's proprietory technology are :

- **'Dry Liming' process** — a proven innovation of AKZO based on their unmatched research, development and operational know-how. The heat of hydration of dry lime is completely utilised in this process, leading to large savings in energy and thus lower costs than in the conventional process.
- Akzo's **'Salt Washing'** design ensures a far better quality of salt and substantial gains through savings in raw material consumption.
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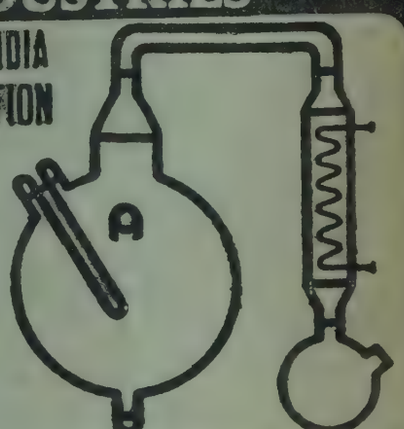
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Saurashtra region has abundant reserves of chemical grade limestone and salt — the two vital raw materials for SODA ASH manufacture. The site for the project has, in its vicinity, ready availability of both these raw materials through the Company's captive salt works and limestone mines.

Sutrapada is in a notified backward area, close to Veraval town on the sea coast and is well connected by road, rail and air.

Consultants

Detailed engineering for the project is being provided by Humphreys and Glasgow Consultants Pvt. Ltd., an associate of Humphreys and Glasgow, London — an internationally renowned engineering consultant in chemicals and fertilisers.

Management and the team

The Company is managed by a Board of Directors under the Chairmanship of Shri H. R. Patankar, Principal Secretary to the Government of Gujarat. The Board includes representatives from the Government, private promoters and financial institutions. A professional, fulltime Managing Director, Shri R. K. Jajoo, looks after the day-to day affairs of the Company and is assisted by a team of experienced specialists each field.

Energy system

The plant has an integrated energy system, making it completely self-sufficient in steam and power. An 11 MW power plant provides captive generation for the entire power needs of the project. There is, in addition, a 100% standby arrangement — doubly assuring continuous supply of power to the plant.

Water system

The cooling water requirements of the plant are being met from sea water— available in abundance adjacent to the site. The process water is being drawn from a large irrigation dam near the site.

Vital product— vast Application

A basic alkali, Soda Ash enjoys wide and ever increasing uses. Soda Ash is an essential raw material for a vast range of industrial and consumer products including glass, detergents, sodium silicates and bicarbonates, bichromates, paper, textiles, dyestuffs and as an industrial water softening agent. Soda Ash is also extensively used as a cleaning agent in houses, factories, commercial establishments and laundries.

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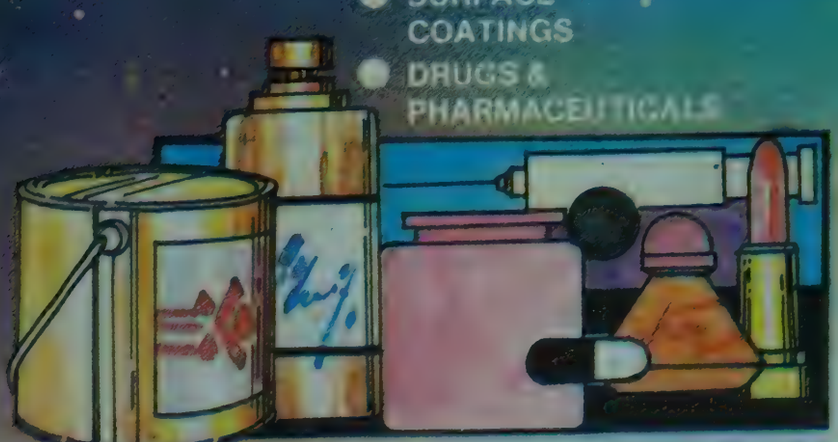
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WET BLUE: THE MANUFACTURING AND TRADING

Dr. HEINZ KELLER
Prime Tanning Co., Inc., Berwick, USA

Recently released figures of the FAO in Rome show that today's worldwide shoe production is 8 billion pairs. The estimate is that by the year 2000, 11 billion pairs of shoes will be manufactured. This is an increase of 40%. The world hide supply increased over the last 12 years by only 1% per year. This means that we will have a short fall of 30% of leather making substance by the year 2000. At the moment the best hopes of augmenting this short-fall lie in the increased use of pig skin and better utilisation of hides. The shoe industry worldwide consumes about 80% of the leather production, but the upholstery and garment industries are increasing their leather consumption at a much higher rate than the shoe industry.

The shoe industry is presently relocating from the traditional shoe producing countries in Europe and the United States towards Asia and South America. The main economic justification for this relocation is the high percentage of labour in the manufacturing of shoes which favours lower wage countries such as Korea, Taiwan, Thailand and India.

The leather producing countries can be divided into the ones that have excess raw material such as the United States, Argentina and Australia and the net importers of leather making substance such as Italy, Portugal and Korea. India seems to be on the turning point of becoming a net importer of leather because its leather consuming industries are expanding very rapidly.

Let us now have a look at the companies who produce leather. These can be divided into 4 groups:

1. The traditional "full tannery" which buys raw hides, tans them into leather and sells this leather to shoe factories, garment makers, and other leather consuming industries.

2. "Blue onward" tanneries which buy wet blue and transform it into leather which they in turn sell.

3. "Crust Finishers" who buy crust and finish it to customers specifications.

4. Shoe factories which perform functions 1,2 or 3 for their own use which we refer to as the "Brazilian model". On your continent many of those units can already be found.

Looking at the advantages of each model, we can say that leathers made by tanneries of type 1 have their individual tanning and fashion know-how and specialities. For this reason their products are attractive to the buyers. On the other hand, simple products can be produced by a shoe factory owning a tannery, (type 4). In this way, they can improve delivery and facilitate scheduling in their manufacturing cycle.

Comparing a type 1 to a type 2 and ultimately to a type 3 tannery in every step several options to make a certain type of leather are eliminated.

Finally in the finishing operation (type 3) the crust is already committed to selection, thickness and colour. Many shoe factories which have finished crust in the past, are changing into "type two" tanneries because of the improved flexibility.

Buying wet blue instead of crust broadens the range of products which can be made.

HISTORY

The Blueside Company was originally built by hide processors in the late 1960's. This plant must be considered the first wet blue plant in the world. Prime Tanning acquired this wet blue tannery in the late 60's in order to increase their production at the Maine facility which is 2,500 kilometers away. The plant was expanded in 1978 and wet blue was offered for sale to other tanneries. This was the first trading of wet blue hides. In the meantime other wet blue producers have started operation in the United States and in many other parts of the world such as Australia, New Zealand, South Africa, Germany and England. Today Blueside can process upto 50,000 hides per week which makes it the largest wet blue plant in existence. Half of this production goes to the parent company to be manufactured into various types of leather and the other half is sold as wet blue to about 40 countries all over the world.

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* **Paper presented at the 23rd Tanners Get-Together held at Madras on January 28-30, 1988.**

In the United States the export of wet blue amounts approximately 10% of the total export and this number is expected to grow in the future.

RAW MATERIAL

The United States is presently producing about 35 million hides per year, a number which has been fairly steady over the years.

The majority of these animals have been raised for meat consumption and are predominantly steers and heifers. At slaughter these animals are relatively young, maximum 2 years and therefore their grain is good. Cows are predominantly for milk production and are animals between six and ten years of age when slaughtered. The majority of the steers and heifers raised for meat production are slaughtered in big slaughter houses called packers. Many of these packers kill upto 5,500 animals per day at the rate of 1 animal every 6 seconds. The take-off is fully automated and almost no slaughter cuts are encountered with these hides because they are pulled mechanically from the carcass. The majority of the hides are then fleshed and trimmed and subsequently cured for preservation.

We are presently buying 60 to 70% of our raw hides fresh. These hides are also fleshed in the packing house and come to us in our cooled trucks in containers of about a cubic meter in size. We prefer fresh hides over brine cured hides because of the better quality of the grain and reduced damage from decomposition. Now one might ask why we are not using 100% fresh hides rather than only 60%. The answer is dictated by the sales needs. We have to commit over long periods of time to the entire kill of the day or for a shift of the packer and we have to take their mix of hides without being able to select the hides we need to cover our sales commitments. For instance if the mix consists of 60% steers and 40% heifers and our sales mix requires 70% heifers and 30% steers we are not able to change their killing pattern but rather have to adjust our soak by adding more cured heifers in order to come out with the desired soak mix.

Let me comment now on other ways of hide preservation. All over the world the curing is being utilized which if done properly certainly produces leather of acceptable quality. However for satisfactory results clean fresh salt must be used and the time allowed must be adequate to achieve proper cure for the hides in that pack. In the United States this method is used seldom because of the time required and curing in raceways or mixers is prevailing. For short-term preservation several suggestions have been published in the Trade journals. To my knowledge, however, very few have been utilized in commercial application primarily for cost and quality reasons.

The pickling of hides has been suggested and tried in several countries. The advantage of this method lies in the possibility of utilizing the pickled material for the vegetable tanning process. The negative aspect however is the pickling action continues which prevents shipping this material to countries of permanently high temperature which results in leather that is consistently looser in the structure than either salt cured or other preservation methods.

The short-term preservation of fresh hides by cooling down is being practiced now in many countries and is producing leather of excellent quality. The disadvantage of this process is that the preservation can be extended to a maximum of 24 hours. This is done presently in Germany. There the individual hides are hung into a cooled refrigeration truck and then transported to the tannery within the 24 hour period. In the United States we collect the hides in boxes after cooling down from the body temperature with cold water. This method allows transportation within refrigerated trucks within 10 hours without any damage to the hide.

The advantages of short-term preservation by cooling are their low cost and their good results. In addition there is a substantial reduction of salt loading in the effluent which becomes a benefit of ever increasing importance to the tanner. The disadvantage is that ample hide supply must be within a relative short distance to the tannery making this method impossible to use for export. There is no doubt that the best way of preserving high quality hides for export is the proper wet blue tanning process which will be described on the following page.

SOAK

Historically this process has been done in mixers. Today however our plans are to do all soaking in paddles and drums. Today's paddles are loaded with 10,000 pounds and drums with 30,000 pounds. We are using long floats at 80 to 82 Degree F sharpened with soda ash, little preservative and emulsifier. On fresh hides we only adjust the temperature upto 80 to 82 Degree which takes 2 to 3 hours. Cured hides require an 8 to 12 hour soak.

We are extremely sensitive to the slightest grain deterioration which shows later on in a suede effect in the

crust because the majority of the leather that is made from the wet blue is high quality aniline leather or other full grain leathers. Addition of enzymes in the soak therefore have to be used with caution in order not to attack the sensitive grain in this stage of the process. We believe leather is still made in the beamhouse. Ten years ago many companies were proud to report that they are capable of making leather from soak through chrome in 24 hours. We were one of them but today we are proud to report that we need 52 hours in order to produce a higher quality product. The proper rewetting of cured hides certainly has very important influence in the quality of the final leather.

LIME

Liming is done in paddles and drums again in long floats at the same temperature as the soak. Chemicals used are lime, sodium sulfhydrate, sodium sulfide, some emulsifier and some deswelling agent. Together with the relime it takes 24 hours to unhair and properly open the fibre during this process and to minimize the draw. U.S. hides on the average are much heavier than the hides you may be accustomed to in India and therefore these 24 hours must be considered the minimum to produce quality leather from U.S. hides.

We opted to change the process vessel after liming for safety reasons. All heavy sulfide containing wastes are discharged into a separate sewerage treatment system which will never come in contact with acid streams from pickle or chrome tannage. This eliminates the formation of hydrogen sulfide which as we all know is the major cause of accidental death in the tanning industry all over the world. It costs extra money to change from one vessel to the other but we gladly pay this in order to protect our employees from possible harm. At this point it would be well to touch on splitting and at what point it should be done. We have opted to split in the blue for various reasons. Splits are better and more easily traded when in the wet blue and all leathers are produced with a tighter grain when split in the blue. When hides are split in the lime better yield, smoother grain and a better tensile strength in light leathers result. In the United States most tanneries with the exception of the upholstery tanners have opted to split in the blue.

DELIME, BATE

In our process, after all stock is transferred into drums of the same size as the lime drums, at which point a good wash deliming is done in short float with ammonium salts. Bating is in the same float with pancreatic bate. Total time for washing, deliming and bating is approximately 2 1/2 hours.

PICKLE

After wash to reduce the temperature the pickle is done in short float with salt, sulfuric acid and sodium formate for a period of 3 to 5 hours.

CHROME TANNAGE

In a new float the chrome is then added. We manufacture our own chrome in house from bichromate reduced with sugar and sulfuric acid. In the beginning of the tannage anti-mold is added to allow complete penetration of this important product during the tanning process. The basification is done by slow addition of sodium bicarbonate. The end pH is 3.6 to 3.8 and the chrome content in the leather is 4% on a moisture free basis or 4.5% on 14% water basis.

No load is dumped without verification by the laboratory as to whether the anti-mold has been added and penetration into the hides has been accomplished. This is done with the help of a gas chromatograph which is on hand 24 hours, 7 days per week. Other laboratory data are taken continuously during the proces in order to ensure a consistent product. Through process control we have been able to keep the chrome content of the leather within narrow limits of plus/minus 5%.

EFFLUENT SYSTEM

By far the major portion of the cost of a new tannery today is the cost for the proper effluent purification system. Our company has from early days made every effort to meet all U.S. effluent guidelines. As a result of this most of the national data and guidelines for the U.S. tanning industry have been derived from the operation at Blueside. Even though many books have been written about this effluent system we are constantly improving this system in order to minimize costs and optimize clean up of the pollutants. The system that is presently operating I can outline to you as follows. The alkaline and acid streams are separated from the chrome bearing streams which are going directly into the chrome recovery. All the alkaline streams go to a sulfide oxidation that is assisted by a catalyst into a primary clarifier where the majority of the sludge is settled and separated. The supernatent is then treated in a biological oxidation system and clarified in a second clarifier. In the summer our sludge production is 100 tons per day while in the winter this goes upto 130 tons per day due to the longer hair of the animals. The sludge is presently

spread on land and used as fertilizer for a variety of crops on farms nearby. The chrome bearing waste is settled and chrome precipitated in form of chrome hydroxide. It is then decreased and the sludge concentrated and passed through a filter press. The resulting chrome hydroxide cake is then dissolved in sulfuric acid and added to the newly made chrome.

POST TANNING OPERATIONS

Immediately after the wet blue is discharged from the drum it is wrung in continuous whole hide wringers to approximately 52 to 54% moisture. The material is then classified by thickness, grade and type of animal from which the hide is obtained. It is also separated into branded and non-branded selections. At the moment we classify into about 8 thicknesses, four grades and four to six different hide types in order to use the wet blue for the optimum type of leather. The hides are then split in whole hides to the desired thickness and packaged after final inspection on ten pallets which fit into a 20 ft container.

The savings of freight can be quite substantial, for instance, if cured hides are put into a 20 ft container normally 700 hides are loaded. Unsplit wet blue can be loaded at 775 hides per container in the case of steers. If the same wet blue steers are split into upholstery grade at 1.4, 1.6 mm., 1900 hides can be loaded into one container.

PROBLEMS TO WATCH

Mold is a problem with wet blue if the mold prevention has not been executed properly. This is especially true when split material is shipped because very often the anti-mold is not penetrating deep enough and when split the middle surface is not properly preserved. The same thing is basically true of the upper side of the split. Unfortunately the chemicals used for mold preservation are very expensive and many tanners like to save money on those chemicals. In very hot and humid climates as you have in India, the prevention is more important than in colder climates.

The second problem to watch is the quality of the wet blue. Wet blue that looks nice may be wet blue that is just unhaired in a short process and chrome tanned with very little chrome, again in a short time. The resulting leather, though mostly uniform in colour, varies in softness from neck to butt. Furthermore, the leather has to be over neutralized in order to produce a soft leather. This usually results in a loose break. In many parts of the world but especially in U.S., hides vary from truckload to truckload and from season to season. If the shipper guarantees the grade, these seasonal variances can be overcome. If, however, the buyer is not aware of the difference between summer and winter hides he may be in for bad surprises concerning grain quality and quality of fleshing.

WHY WET BLUE?

1. Wet blue is the best way of preserving high quality hides for export.

Short term preservation methods cannot be used for export and the traditional methods of curing and salt packing produce leather of inferior quality.

2. Buying wet blue eliminates the biggest portion of the pollutants. The biggest contributor to pollution is coming from the beamhouse and the tanning process; therefore buying wet blue reduces the effluent load substantially and contributes to a cleaner environment. The cleaning of effluent in big units can be done more efficiently and at lower costs than in smaller units.

3. Wet blue can be selected. The tanner can buy wet blue that has been properly selected for thickness and grade to conform to his needs. The seasonal variances in the raw material can be absorbed by the wet blue producer rather than a tanner who does not have to cope with low selection at times when he has no customer for them.

4. Wet blue can be shipped as grain splits. This allows the split to be sold in areas of the world where it yields the best return. When shipping grains only substantially lower freight costs result which benefit the user.

5. Big wet blue units produce a more consistent product which benefits the smaller tanner who normally is not capable of controlling his process as well.

6. Wet blue leaves the tanner with great flexibility, compared to buying crust where colour, thickness, type of leather and other very important leather characteristics have been predetermined.

7. The cost of manufacturing is low on a big unit. Labour, as a percentage of the manufacturing cost of wet blue is very small and therefore the overall costs of making wet blue even in high wage countries such as the U.S. does not cost more than the manufacturing of the same product is a low wage country.

8. Free time for management. In many areas of the world top managers are very busy buying hides on a daily basis. Being able to buy large quantities of wet blue of predetermined quality and price enables them to perform other important duties in their tannery.

LEATHER ABSTRACTS

POLYURETHANE: NO NEED TO FEAR TECHNOLOGY, K.J. Sogall, *American Shoe Making,* **361,** (5) 10, 1987

Polyurethane unit soles are comfortable, durable and fit into a wide range of stylish demands but they can also be difficult to produce. The liquid chemicals, a resin and an isocyanate are reacted in the proper proportions to form a solid. This may seem like a simple procedure but in fact it involves more than that. In this paper some of the processing parameters like ratio, temperature and cycling and time are discussed.

TREATMENT OF SALTLESS CURING WASTE USING HYDROGEN PEROXIDE, G. Sekaran, K. Chutia and W. Madhawakrishna, *J.Am. Leather Chem. Asoc.,* **83,** 5, 1988.

An alternative curing technique for hides and skin using phenol borax mixture is presented in this paper. The characterisation of spent liquor, first soak liquor and second soak liquor is referred. Anaerobic treatment of phenolic waste liquor does not yield the desired results, but treatment with hydrogen peroxide and a catalyst yielded good results. The optimum ratio of phenol to hydrogen peroxide is 1:1 (wt/wt) and ferrous sulphate added is 200 mg/l. After treatment with H_2O_2, the waste liquor still contains 0.15mg/l of phenol and is black in colour, and this can be removed by treating with lime (1600 mg/l) under agitation at low rpm.

LARGE SCALE RECOVERY FROM CHROME WASH LIQUORS, D A Boast, *J. Am. Leather Chem. Assoc.* **83,** 17, 1988.

This paper describes the incorporation of a plant for chrome recovery from chrome wash liquors by precipitation , settling out of the chrome sludge, and subsequent re-solubilisation of the chrome in the sludge by acidification.

The supernatent containing very low concentration of chrome (<100 mg/l Cr_2O_3) replaces the excess chrome liquors that were previously discharged to effluent thereby reducing the chrome content in the effluent to an absolute minimum. The chromium in the mixed effluent was reduced from 508mg/l to 54 mg/l Cr_2O_3 as an average after installation of the recovery plant. The savings in cost of chrome tanning salts can make this system profitable as well as considerably reduce the chrome content with effluent.

USE OF ZEOLITES IN PIG SKIN CHROME TANNAGE, I. Anxor, B. Drzaj, A. Gantar, B. Suk and I. Vizovisek, *Kozaiobuca,* **11,** 265, 1987.

This paper describes the properties of zeolites and their part in chrome tannage. The effect of zeolites of various origin in chrome tannage of pig skins is discussed. The qualities of leather has been found to be good.

LOW SULPHIDE HAIR-SAVING LIMING PROCESS, Heinz-Guenter Mayer, *The Leather Manufacturer,* **105,** (11) 14, 1987.

A process to remove considerable load of the effluent through hair-saving liming is discussed. The hair save method in these experiments reduced the contamination of the lime liquor by about 50%. The over all reduction of the effluent load, chrome tannage included, was only about 30%, and there was a reduction in CoD value by only 15%, as a result of hair-saving liming process.

NEW PRODUCTS

COMPOSITE MATERIAL FOR BOOTS & SHOES

Apar, a unique composite material is now being marketed to manufacturers of comfort footwear component makers as well as shoe boot manufacturers. As compared to sheep skin, it cools down two times faster than sheepskin in summer, warms up 30% faster in winter, while keeping the wearer 30% drier all year round. Apar materials are being used as boot linings as well as in sock lining for comfort sandals.

(American Shoe Making, **361** (5), 1987)

VISCOLITE

A viscoelastic polymer for use in soles has been developed by Polymer Dynamics Inc., U.S.A. The new material has been created through polymer/polyurethane chemistry engineering, biomedicine/biomechanics and computer aided design (CAD). The new material retains the dimensional qualities of a solid while reacting to impact forces like a liquid. It directs force energy along a latitudinal rather than a longtitudinal plane and it transmits a partly reduced ratio of shock force.

(American Shoe Making, **361,** (8) (98))

NEW MATERIAL FROM STAHL

An important new material having the appearance and performance remarkably close to that of leather has been introduced by Stahl. The material has been developed using advanced water-based technology and is suitable for sports shoes, shoe linings, shoe uppers, up-holstery, car interiors and clothing. It is different and its availability creates a new generation of high quality coated fabrics. Stahl has also developed pure water-based coatings and finishes for this material, which result in excellent hygienic properties in addition to an attractive appearance.

(Foot Wear Digest International, Nov/Dec., 1987)

LEATHER-LIKE COATINGS

Senosoft a soft feel paint developed by West German based Schramm Lache is being used on the common canvas to coat the side grip handle.The polyurethane based coating imparts a soft leather-like surface to the handle, enhancing its appearance and feel and protecting the base material. The coating is applied as a base coat and surface coat, using conventional hand or automatic spray techniques.

(Footwear Digest International, Nov/Dec., 1987)

SATLAN

The tannery Capdi Luciani, a leader in the sector of sheep skin with wool, has a highly innovative material to propose for shoe uppears with spring/summer collections. This new patented material is a reversible, punched, shearling, tanned and washed using special processes.

The shoes are to be worn without socks or stockings, since the wool offers considerable advantage in terms of comfort and hygiene. The reversible sheep skin can be two coloured i.e. white, champagne-coloured or beige wool combined with leather of any colour. The new material can, in fact, be washed with soap and water without fear of detracting from its appearance in any way.

(Foto Shoe, **13,** (8-9), 1987)

INDIAN LEATHER SCENE

LEATHER FOOTWEAR UNITS SEEK RELAXATION

The Government should relax the 'backward area' policy in respect of the leather footwear industry so as to enable it achieve the production and export targets set for the years to come.

At present, new footwear units with investments ranging from Rs.75 lakhs to Rs.1 crore are allowed to be set up only in backward areas and subject to accepting an export obligation of 75%. This has proved to be an impediment to further growth of the industry, according to Mr. A. Sahasranaman, Executive Director, Council for Leather Exports (CLE).

According to him, while the export obligation will have to continue in the interest of the overall export policy of the Government, the backward area stipulation should be relaxed to facilitate setting up of new units with an investment of up to Rs.1.5 crores anywhere in the country.

Addressing a seminar on 'Leather, leather products and allied industries—1990', organised by the Small Industries Service Institute Mr. Sahasranaman pointed out that a change in the industrial policy to this effect has become necessary in the context of the Rs.6000-crore export target envisaged for the leather industry by the turn of the century. A substantial part of this has to come from the footwear sector.

He estimated that footwear export will have to go up to 195 million pairs by 2000 AD from the level of 16 million pairs as of now. This will mean a hike in the production capability in the modern sector by an additional six lakh pairs per day over the next 5-6 years with the setting up of 600-700 new units of capacities ranging from 800 to 1000 pairs a day.

The backward area restriction will come in the way of a capacity expansion of this magnitude, Mr. Sahasranaman observed. Besides, the so-called backward areas lack in infrastructural facilities like power, transport and communication.

Apart from export, the domestic market is projected to become stronger in the future. Therefore, the production base has to be planned taking into account the export as well as domestic market requirements, he noted.

India's future in the export market appears bright considering that the total global import of leather and leather products has been rising steadily during the past few years. From about $ 16 billion in 1983, it has gone up to nearly $ 24 billion last year. This is accompanied by a simultaneous increase in the share of the developing countries in exports.

Currently, the world market for leather and leather products is dominated by South Korea, Taiwan, Brazil and Italy. But in all these countries, the cost of production has been showing a rising trend forcing the buyers from developed countries to look for other sources of supply. Countries like India and China stand to gain in such a changing scenario, Mr. Sahasranaman said.

But the industry in India faced certain problems which should be solved without delay to enable it capitalise on the present situation in the world market. One of them pertains to raw material availability. The domestic resources may not take the country too far in the export front. While there is scope for augmenting domestic availability by upgradation of low-grade leathers and avoiding wastages, import of hides and skins in substantial measure has become imperative.

Other areas which needed attention were creation of manufacturing facilities for components like fittings, zippers, linings and soles, proper training of technical manpower and design and product development, Mr. Sahasranaman said.

As for marketing, he advocated micro-level strategies involving individual companies. A consortium approach by four or five small producers joining hands and setting up an independent marketing organisation, which has proved successful in countries like Japan and South Korea, can also be tried in India, he added.

Mr. M. Rafeeque Ahmed, Chairman, Indian Finished Leather Manufacturers and Exporters Association, who presided, pleaded for adequate finance for importing wet blue and crust leathers in reasonable quantities. Also, the source of supply should be widened to include North

and South America, Australia and New Zealand. In addition, the Government should give subsidy to the extent of 40% of the marketing costs of brands. The higher unit value realisation in the form of foreign exchange will compensate this subsidy, Mr. Rafeeque pointed out.

He also wanted the Government to include footwear, leather garments and leather goods in the trade agreements to be entered into with the U.S.S.R., G.D.R. and other East European countries.

IMPORT SUBSTITUTION: CLE SEEKS CENTRE'S SUPPORT

The Council for Leather Exports (CLE) wants the Centre to support the leather industry in its efforts at import substitution in reaching the export target of 200 million pairs of footwear by the end of the century.

Though this might not fetch immediate return, no time should be lost to take that step, given the changing shape of the global market with the arrival of China as a rival to India and the decline of Taiwan, South Korea, Brazil and Italy as the principal exporters of leather products, according to the CLE Executive Director, Mr. A. Sahasranaman.

Addressing a seminar on packaging of footwear for export in Madras he said the non-availability of "components" is one of the impediments which has to be overcome. The seminar was organised by the Institute of Pacakaging.

In fact, CLE had suggested radical changes in this respect. The export of good quality shoes had to increase from the present three million pairs to 10 million pairs by 1990. Now the total export of footwear was 20 million pairs, bulk of which comprised low price range varieties.

Stressing the need for the manufacture and use of items like packaging materials currently imported, Mr. R. Subramanian, Director of the Institute, said that standardising the manufacture of packaging material required for export in all its aspect is the first step. Most exporters did not seem to know what their requirement were, he said.

The next step is to ensure uniform dimensions of the packagings with a view to saving on the freight. More attention could also be paid to graphics and designing the packing material. Mr. S.N. Mathur, a representative of International Trade Centre, Geneva, explained that the seminar is part of a project initiated by the Centre for promoting the export of footwear from North Arcot. The effort to make available indigenous packing material of standard quality acceptable in international markets is a component of the project. The Indian Institute of Packaging is involved in it.

FINISHED LEATHER UNITS SEEK BETTER DEAL

Although the Union Government has identified the leather industry as one of the thrust sectors, its measures seem to discourage the export of finished leather and boost export of leather goods and products, Mr. M. Rafeeque Ahmed, President, Finished Leather Manufacturers and Exporters Association, told the members at the annual general meeting held in Madras, recently.

The Union Commerce Ministry withdrew the Cash Compensatory Support of five per cent on FOB value, while the Finance Ministry reduced the all industry rate of duty drawback on finished leather to seven per cent of FOB value. The Finance Ministry had also restricted the remittances of agency commission.

In spite of all these constraints finished leather to the tune of Rs.400 crores had been exported during 1986-87 against a total leather export of Rs.930.81 crores. He highlighted the fact that in a developing country which is in the transitional process of switching over to export of leather products, the significant role played by manufacturers of finished leather had been totally ignored.

The Association President said the leather products segment lacked the infrastructure to absorb the major portion of the finished leather produced in the country. Therefore, the Central Government, while promoting exports of products should not kill finished leather exports.

The recent drought had taken a serious toll of cattle resulting in lower availability of hides and skins. The price of hides had increased sharply. The quality of hides was also poor because of the drought. This had necessitated imports. The Government should offer soft loans for such imports, he suggested.

Referring to the increase in duties on chemicals used in tanning and finishing of leather, leading to higher production costs, he suggested that the Government restore the original duty of 45% ad valorem levy on syntans and fat liquors. The locally available chemicals were not up to the standard for making leather of internationally competitive quality. These chemicals should be upgraded with the help of the Central Leather Research Institute

PROMISING OUTLOOK FOR LEATHER AND VALUE ADDED EXPORTS

The target of exporting 200 million pairs of footwear by the year 2000 AD can be achieved only if modern production facilities are created at a brisk pace, according to Mr. M.M. Hashim, Chariman, Council for Leather Exports (CLE). In a review of the performance of the leather industry the chairman has suggested that it will be desirable if in the next five-six years, the capacity to manufacture about six lakh pairs daily is created.

Mr. Hashim has emphasised that investments should be encouraged in units with capacities ranging from 800 to 1,200 pairs daily. To enable large scale participation, enhancing capacities of footwear making units should be delicensed for investments under Rs.1.50 crores. This would be a healthy development, if steps are taken to ensure that production facilities are assisted by new units making various components of requisite quality. One of the critical drawbacks is that there is a good raw material base, yet totally dependent on supply of components and consumables from outside for making good quality shoes. The dependence on other sources for all sorts of components not only entails delay but also uncertainty and pushes up costs and creates production bottlenecks.

Mr. A. Sahasranaman, Executive Director, CLE has said there is no running away from the fact that the continued success in this field will depend upon augmenting raw material availability. He agreed that a lot remained to be done to improve the quality of domestically available hides and skins. It is discouraging to note that about 200 million sq. ft. of leather is not properly utilised since they are of low grade. These types of leathers, throughout the world, are upgraded through the use of polyurethane films.

This could also be done within the country, but the Government has levied an import duty of 234% which should be reduced to 40%. It is strange that the Centre permitted import of similarly upgraded leathers at almost nil duty. This apart, pretanning practices will have to be improved and collection of hides and skins systemised, so that whatever losses incurred during these stages can be eliminated. Steps should be taken to keep imports within manageable levels, if the Government conceded the requests of the industry and tanneries succeed in upgrading lower quality skins.

Export Target Exceeded

A similar approach is required with regard to exports of leather goods. Competition has become severe. According to latest statistics of exports available for 1987-88, the figure has touched Rs.971.12 crores (April 1987 to January 1988) registering an increase of 32% over the previous year. It is anticipated that by the end of March 1988, exports should exceed Rs.1,200 crores. This figure has ensured that the export target set for 1989-90 of Rs.1,070 crores has been crossed even during 1987-88. Credit should be taken by the CLE to strictly adhere to export of value added leather and leather products and this has been growing at an encouraging pace. Footwear and footwear manufacture dominate exports closely followed by leather garments and products. The Federal Republic of Germany is expected to lead the list of importers with 17% of leather products followed by the Soviet Union, U.S., U.K., France and Italy.

Trend in Exports (In million rupees)

	April-Jan. 1987	April-Jan. 1988	(Apr-Mar. 1987-88 (estimate)
Semi finished leather	295.97	248.82	500.00
Finished leather	3275.90	3928.76	4400.00
Leather footwear	578.22	984.62	1300.00
Footwear components	1986.24	2669.94	3200.00
Leather garments	450.16	834.05	3200.00
Leather goods	611.69	834.45	1360.00
Saddlery & harness	96.99	121.55	140.00
Others	71.53	99.04	--
Total	**7366.70**	**9711.23**	**12000.00**

The leather industry throws up many interesting possibilities. Initially, there is good scope for promoting joint ventures for manufacture of different varieties of leather goods and products for possible buy back or export to third countries.

The CLE has taken up schemes to send technicians abroad for training in design institutes and has also invited leading designers from Europe to visit India and meet adequate number of tanners for detailed discusions on their capacity and capabilities to cater to volume requirements of departmental stores in Europe. India's vast resources of raw hides and skins has been recognised by the developed countries who are now turning to take a hard second look for supply of leather at competitive prices. This has been possible due to the various delegations sent out by the CLE to promote awareness about the country's capabilities to the buyers abroad.

LEATHER NEWS FROM ABROAD

DEAR DEER

Deer skins and leathers have shown sharp increases in their prices due to substantial purchases of US deer skins by the Japanese and Koreans who are taking advantage of the weakness of the dollar. Tanners are paying between $4 and $5 more per skin than they did last year with leather prices correspondingly higher. Skin prices at the start of the current season ranged from $6.50 to $7 with better grades of heavier type ranging uptwards to $9. (*Leather,* **190,** 4553, 1988)

TAG PRODUCTS

A scheme to tag products made from the skins of protected species has finally got German Government approval. The tags give each product a code denoting place of origin, name of producer, the CITES authorisation code and point of import. Thus the consumer can be assured the product is made from the skin of a farmed or legally culled protected species. (*Leather,* **190,** 4553, 1988).

FRG LEATHER IMPORTS

Leather imports, which during the last seven years have been running at almost 40% above the 1970 figure of 24,000 tonnes went upto 36,000 tonnes, a further rise of 5% in 1986 and 1987. Half of these came from Italy and the rest mostly from India, France, UK and S. America. Leather imports however include both finished and crust leathers used for further processing by tanners and these unfinished imports can basically be regarded as raw material. (*Leather,***190,** 4553, 1988).

WEST GERMAN LEATHER & FOOT MACHINERY

The West German Leather and Footwear machinery industry has one of the country's highest export quotas -- 94%. In 1986, 116 countries around the world bought West German machines. Over half of this went to industrialised countries, mainly Europe. Another quarter went to Eastern Bloc countries and about a fifth went to developing countries. USSR, in the last two years, has emerged as the biggest single market for German made leather and footwear processing machinery taking 16.2% of the German exports followed by France (8.7%), Austria (6%), Yugoslavia (5.5%) and Great Britain (4.3%). Three countries in the Far East, namely, China, Japan and South Korea now figure among the top 15 buyers of German machinery. The following is the breakdown of production in the West German footwear and leather processing machinery industry and export of machinery:

Production	in DM million	As % share of production
Tanning Machinery	62.0	11.5
Footwear manufacturing Machinery	296.8	54.8
Sewing machines for footwear industry	140.0	25.9
Production machinery for Leather goods	20.3	3.7
Footwear repair machinery	22.0	4.1
Total	541.1	100

Export	in DM million	Country's share %
USSR	82.4	16.2
France	44.2	8.7
Austria	30.5	6.0
Yugoslavia	28.0	5.5
Great Britain	21.9	4.3
Portugal	20.3	4.0
USA	20.3	4.0
Italy	18.3	3.6
Spain	15.3	3.0
People's Republic of China	14.2	2.8
Netherlands	13.7	2.7
Japan	12.2	2.4
South Korea	12.2	2.4
Brazil	11.9	2.3
Hungary	10.7	2.1

(*Leather,* **190,** 4553, 1988).

U.S. LEATHER INDUSTRY

The U.S. leather industry, once the world's largest, has slipped to fourth place (see table on next page). Twenty five years ago there were 400 US tanners. Today they are fewer than 100. The US footwear industry has also suffered due to footwear imports which now

account for 83% of the domestic market. And whereas footwear traditionally accounted for over 70% of all leather consumption, the fate of the tanning industry has been closely hitched to that of the footwear industry.

World Leather Production (1987 estimated)

Category	Bill. sq. ft.
Light bovine leather	8.6
Heavy bovine leather	1.3
Other light leathers (mainly goat, sheep)	3.6
Pig skin	1.2
Others	0.3
	15.00

Largest Leather Producers 1987 (Estimated sq. ft)

Country	Light Bovine	Goat, Sheep	Total
Italy	900 mil.	600 mil.	1.5 bil.
USSR	800 mil.	400 mil.	1.2 bil.
India	700 mil.	400 mil.	1.1 bil.
USA	80 mil.		0.08 bil.

(Footwear Manufacturing, **180,** (6) 1987)

AIR-RIDER

The latest product, 'Air-rider', a purpose-built walking shoe has been introduced by Clark Shoes. It is as much lighter and more flexible than a hiking boot but more durable than a normal shoe and has been designed "purely to enhance the joy of walking". It is the ultimate casual shoe which is tough, good looking but above all, supremely confortable. (*Shoe & Leather News,* (3743), 1988).

COOL COMFORT INSOLE

An economy-grade real leather insole is the latest introduction to the Dasco range. Manufactured from full grain sheep leather, the new insole is cushioned with foam for comfort and textured to give good grip. It is impregnated with Actifresh to destroy the bacteria which cause foot odour and help keep the feet fresh. (*Shoe & Leather News,* (3743), 1988).

PAINT BRANDING

Paint branding is a simple, quick and economical method. Results of a recent field test of sheep paint branding fluids conducted by the American Sheep Producers council show blue to be the most durable colour under range conditions. Blue also appeared to bleed less in the scouring process than other colours tested. *(The Leather Manufacturer,* **105,** 1987).

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The prices are inclusive of Excise and Maharashtra Sales Tax.

Chemicals Shoot Up

Many of the important chemicals shot up in the Bombay Chemicals and dyes market during this week.

RCF and HOC had jacked up the prices of methanol and phenol respectively. Methanol had gone up by Rs. 800 per tonne, consequently formaldehyde's price also moved up. Phenol was placed at Rs. 30.50. Some shortage was experienced in Maleic anhydride. It was quoted at Rs. 42.

In the dyes section, the price of MPD was ruling very high.

(Prices as on 13th April 1988)

INDUSTRIAL CHEMICALS	Per kg.
Ammonium sulphate	2.00
Ammonium phosphate (Mono)	14.50
Ammonium phosphate (Di)	12.00
Ammonium carbonate (Di)	17.00
Ammonium bicarbonate	4.75
Ammonium chloride	3.00
Ammonium nitrate	3.50
Arsenic white powder	21.00
Acrylamide (Resale)	58.50
Barium carbonate	6.00
Bleaching powder (33% Cl)	3.80
Borax (Granular)	15.00
Borax (Powder)	15.50
Boric acid (Tech.)	21.00
Bisphenol-A	47+ST
Butyl carbitol	35.00
Caustic soda (Flakes)	8.00
Caustic soda (Solid)	7.60
Caustic soda (Lye)	6.00
Calcium chloride 70% (solid)	3.25
Calcium chloride 75-80% (fused)	3.50
Calcium chloride 36% (Anhydrous)	5.00
Calcium Carbonate PPT	3.00
Calcium carbonate (Activated)	3.55
Camphor (Indian)	82.00
Cresylic acid	50.00
Cream of Tartar (Tech.)	64.00
Citric acid (Beigium) (Resale)	45.00
Citric acid (Indian) (Resale)	44.00
Copper sulphate	17.50
Chromic acid	50.00
Cyanuric chloride	120.00
Cobalt oxide	280.00
Carbitol	51+ST

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Dicalcium phosphate (Anhydrous)		16.00
Ferric chloride (Lumps)		6.50
Ethylene urea		56.00
Glue flakes		8.45
Glue sheets		6.75
Gohsenol GH-17		83+ST
Hydro		32.50+ST
Hyflosupercell		18+ST
Hexamine	(Resale)	42.00
Industrial Wax		25.00
Litharge		15.00
Lead Acetate (Tech.)		28.50
Lithopone		15+ST
Magnesium chloride (crystal)		1.80
Menthol crystal (Flakes)		185+Ex.+ST
Menthol bold		205+Ex.+ST
Menthol crystal bold		245+Ex.+ST
Magnesium carbonate (Japan)		16.00
Magnesium carbonate (Indian)		15.00
Maleic Anhydride (per kg)		42+ST
Mercury (75 lbs.)		9,000.00
Nickel chloride		90.00
Oxalic acid	(Resale)	20.00
Peppermint oil (Rectified)		90+Ex.+ST
Potassium carbonate (indian)		19.00
Potassium carbonate (Imported)		21.00
Potassium bichromate		22.00
Potassium phosphate (Mono)		14.00
Potassium phosphate (Di)		14.00
Polyvinyl alcohol (No. 117)		88.00
Polyvinyl alcohol (No. 173)	(Resale)	92.00
Polyvinyl alcohol (No. 208)		78.50+ST
Paraformaldehyde	(Resale)	22.00
Phthalic anhydride 36%	(Resale)	24.00
Pentaerythritol	(Resale)	51.50
Paraffin wax	(Resale)	14.50
Rangolite (German)		70.00
Rangolite (Czech.)		50.00
Sodium sulphate (Fine)		4.00
Sodium sulphate (Coarse)		3.80
Sodium sulphide 50-52% (Flakes)		8.00
Sodium sulphide 58-60% (Flakes)		9.00
Sodium sulphide pure (Flakes)		12.25
Sodium nitrite	(Resale)	16.00
Sodium chlorite 80% (Spain)		92.00
Sodium chloride 50% (Spain)		81.00
Santobrite (Indian)		36.00
Soda Ash (Tata)		4.00
Soda Ash (Birla)		3.80
Soda Ash (Imp.)		3.50
Sodium bicarbonate		5.25
Sodium bisulphite		4.50
Sodium silicate		3.00
Sodium acetate		6.00
Sodium alginate		110+ST
Titanium Dioxide (Anatase)		51+ST
Titanium Dioxide (Rutile — RCR_2)		69+ST
Tartaric acid (Crystal)		94.00
Trisodium phosphate		4.80
Thiourea		70+ST
Urea (Tech)		2.75
Vacuum salt		1.00
Zinc Dust		30.00
Zinc Oxide		30.00
Zinc chloride powder (technical)		14.00
Zinc sulphate		4.00

SOLVENTS		Per kg.
Acetic Acid (Glacial)	(Resale)	13.35
Acetic Anhydride	(Resale)	30.00
Acetone	(Resale)	17.00
Adipic Acid		51+ST
Aceto Acetanilide		50.00
Aniline Oil	(Resale)	42.00
Benzoate Plasticiser		33.00
Butyl Acetate		36.00
Butyl acryiate		95+ST
Butyl stearate		36.00
Butanol	(Resale)	35.00
Benzyl chloride		24.00
Benzo trichloride		16.00
Benzoyl chloride		22.00
Bromine Liquid		42.50
Chloroform		24.50
Carbon Tetrachloride		13.00
Cellosolve		47.00
Cyclohexanone		45+ST
Cyclohexanol		43.00
Diacetone	(Resale)	35.00
Diethyl Oxalate		34.00
Diethylene glycol (DEG)		35+ST
Dioctyl Phthalate		52.00
Diallyl Phthalate		56.00
Dimethyl Phthalate		28.00
Dioctyl Adipate		52.00
Dibutyl Adipate		42.00
Dipentene		15.00
Dimethylamine 40%		12.00
Dimethylamine 60%		14.00
Ethyl Acetate		20.50
Ethyl Acrylate		46.00
Ethylene Dichloride		11.00
Ethylene Glycol		23.25
Formic Acid (Imp)	(Resale)	27.00
Formaldehyde	(Resale)	7.75
Glycerine (CP)		50.00
Glycerine (IW)		49.00
Hydrogen peroxide 50%	(Resale)	30.00
Isopropyl Alcohol		17.50
Iso Butyl Alcohol		28.00
Monoethanolamine	(Resale)	45.00
Melamine		54+ST
Morpholine (Indian)		65.00
Methyl Ethyl Ketone		41.50
Methyl Isobutyl Ketone		36.00
Methyl Acrylate		42.00
Methyl Dichloride	(Resale)	22.00

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DI BUTYL MALEATE
DI OCTYL PHTHALATE

Manufactured By : M/s. DILIP CHEMICALS — Vapi

COLOUR DEVELOPER-I & II

Manufactured By: M/s. KASAT CHEMICAL (P) LTD., PUNE.

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GLYCERINE	XYLENE
PHENOL	ACETONE
I. P. A.	FORMALDEHYDE
HYDROGEN PEROXIDE	PARAFORMALDEHYDE
TITANIUM DIOXIDE	ETHYL ACETATE
M. E. K.	n-BUTANOL
CYCLOHEXANONE	CALCIUM CARBONATE

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Nitrobenzene	17.00
Nitric Acid (Con.) (RCF)	2.50
Ortho Cresol	31+ST
Phenol (Resale)	30.50
Propylene Glycol	34.00
Polyethylene Glycol (No. 200)	37.00
Polyethylene Glycol (No. 400)	43+ST
Polyethylene Glycol (No. 500)	42.00
Polyethylene Glycol (No. 1600)	14.00
Polyethyene Glycol (No. 4000)	38.00
Polyethylene Glycol (6000)	50.00
Para Cresol	40.00
Styrene monomer	37+ST
Sorbitol	18.50
Sulphuric Acid	2.10
Trichloroethylene	27.00
Triethanolamine (Resale)	42.00
Turpentine Oil (Germany)	8.00
Turkey Red Oil (50%)	11.75
Triethylamine	50.00
Vinyl Acetate Monomer	41.30

SOLVENTS	Per Litre
Benzene	10.25
N-Heptane	8.00
N-Hexane	8.75
Methanol	8.25
Solvent Naphtha Heavy	9.50
Solvent Naphtha Light	8.50
Toluene	11.50
Xylene	15.00

DYES INTERMEDIATES (PRICES ARE WITHOUT TAX AND EXCISE)	
Alphanaphthylamine	60.00
Alpha Naphthol (Imp.)	165.00
Aceto Acetic Ester (Methyl)	63.00
Ammonium Molybdate	180.00
Anthraquinone	70.00
Anthranilic Acid	60.00
2-Amino-4-Nitrophenol (Imp.)	125.00
Blue B. Base (Local)	230.00
Beta Naphthol (Atul)	60.00
Benzidine Dihydrochloride (BDH)	80.00
Bromamine Acid	375.00
BON Acid	105.00
Chicago Acid	280.00
Coach Acid	56.00
C. Acid (Imp.)	260.00
Cyanuric Chloride (Japan)	118.00
2, 4, DNCB	26.00
Dihydrothio PTOS (Imp.)	600.00
Dimethyl Aniline	60.00
Diethyl Aniline	140.00
Di-amino stilbene disuiphonic acid	120.00
3, 3-DCB (Imp.)	180.00
Gamma Acid (Atul)	170.00
H. Acid (Atul)	155.00
G. Salt	57.00
Isophthalic Acid	40.00
J. Acid	260.00
J. Acid Urea	275.00
K. Acid	95.00
MDPS (German)	200.00
MNA	80.00
Meta Unido Aniline	140.00
MPD (Local)	120+Ex+Tax
MPD (Japan)	180.00
Naphthenic Acid	12.00
N-Methyl J. Acid	380.00
N-Methyl Aniline	120.00
Naphthalene (Refined)	22.00
Naphthalene (Refined)	24.00
Ortho Anisidine (OA Imp)	83.00
Ortho Dichloro Benzene (ODCB)	10.50
OT Base	92.00
Para Dichloro Benzene (PDCB)	16.00
Para Anisidine (PA-Imp.)	110.00
Para Anisidine (PA-Local)	87.00
PNA	66.00
Para Cresidine (Imp.)	325.00
Para Amino Azo Benzene (India)	125.00
PNCB	28.00
Para Amino Acetanilide	145.00
1-Phenyl 3-methyl-5 Pyrazolone	120.00
Phenyl J. Acid	360.00
Para Amino Benzoic Acid	170.00
PT Base	88.00
Rhoduline Acid	490.00
Resist Salt	20.00
Resorcinol	140.00
Sodium Naphthionate	64.00
5-Sulpho-Anthranilic Acid	60.00
Sulphanilic Acid	25.00
Sulpho Tobias Acid	100.00
Trichloro Benzene (TCB)	15.00
Tobias Acid	114.00

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Contact Manufacturers :

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Bombay-400 002.
Phone : 315681 (O)
Resi. : 522207, 4123313

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Contact Manufacturers :—

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Telephone : 463096 (Ahmedabad)

(KNS-ADI)

Bombay Dyes Market

(Prices as on 13th April 1988)

ACID COLOUR	Per Kg
Acid Violet 4BS	143.00
Acid Maroon V	110.00
Acid Orange II	77.80
Acid Orange IIY	63.05
Acid Red A	107.25
Crosein Scarlet MOG	155.00
Acid Scarlet 3R	99.90
Acid Red 38N	135.00
Acid Red R2R	132.00
Acid Red RS	88.00
Acid Green V	230.00
Acid Patent Blue AS	250.00
Acid Coomasi Blue	200.00
Acid Yellow 5GN	65.00
Acid Red PG	85.00
Acid Red GRS	78.00
Acid Black 10 BX	121.95
Acid Black BX	98.40
Acid Black Wax	135.50
Procinil Yellow GS (ICI, UK)	265.00
Procinil Red GS (ICI, UK)	530.00
Procinil Blue RS (ICI, UK)	315.00
Procinil Scarlet G (ICI, UK)	600.00
Procinil Orange G (ICI, UK)	250.00
Procinil Rubine (ICI, UK)	550.00

DIRECT COLOURS	Per Kg.
Yellow 3GX	88.10
Gun Yellow RCH	124.00
Fast Yellow GCH	141.15
Yellow CFG Hly. Conc.	312.00
Fast Yellow GS	111.65
Fast Yellow CHRS	95.45
Viscose Orange	166.15
Fast Orange GR	133.75
Red	96.90
Dark Tan	78.25
Red IIR	72.55
Red 4B	169.10
Bordeaux BW	132.30
Fast Scarlet 4BS	166.55
Red 12B	170.55
Bordeaux Hly Conc.	194.00
Cotton Red N	117.05
Brill. Fast Helio B	278.00
Brill. Fast Helio 2B	297.00
Brill. Fast Helio 2RS	136.20
Brill. Fast Helio BS	116.10
Brill. Violet Extra	126.40
Blue 2B	86.40
Blue G	170.50
Sky Blue FB	188.25
Copper Blue GR	147.00
Fast Greenish Blue GL	114.60
Developed Black BT	116.10
Blue NB-2B	300.20
Blue NB-2BC	185.30
Developed Black NB-GHB	185.30
Green B	111.65
Green NB-B	188.25
Green 2B-N	188.25
Brown MR	154.40
Brown CN	107.25
Golden Brown G	140.35
Catechin G	120.50
Omega Tan	126.40
Catechin GS	102.80
Black E Hly Conc.	142.60
Black E Extra Hly Conc.	142.60
Black NB-ER Hly. Conc.	310.50

DISPERSOL COLOURS	Per Kg
Yellow 6G Powder	143.80
Red B 3B Powder	247.80
Red B 2B Powder	323.20
Red CB Powder	439.15
Red D2B Powder	477.40
Violet C 4R	521.90
Blue BG Powder	235.45
Blue BN Powder	103.75
Blue D 2R Powder	476.25
Navy BT Powder	243.90
Blue B 2G Powder	210.20
Black BT Powder	182.60
Blue BR Powder	390.20
Yellow 7GL	338.60
Yellow 5RX	218.80
Yellow 3G	367.25
Yellow	140.00
Yellow AL	135.30
Yellow Brown REL	247.50
Yellow FFL	463.60
Gold Yellow GG	259.70
Pink REL	247.00
Red REL	468.65
Red 2B	327.40
Red FB	324.20
Red Violet FBL	469.85
Orange 3R	196.65
Violet 3R	280.00
Violet RL	275.45
Violet 6R	485.75
Scarlet RR	214.85
Rubine 3B	223.05
Rubine CB	364.90
Blue GL	318.95
Blue BGF	636.55
Navy Blue RF	270.40
Brown 3REL	200.40
Black GEL	324.20
Dark Brown 3B	317.40

BASE COLOURS	Per Kg
Fast Yellow	80.20
Fast Orange GC	135.45
Fast Scarlet R	166.90
Fast Scarlet RC	126.65

Delhi Market

DELHI: APRIL 15 (NNS) — Sodium nitrite and tartaric acid dropped further by Rs. 45/75 per 50 kg. in the local chemicals market during last week owing to nervous selling by stockists caused by shortage of money, says NNS. Rangolite Germany also slipped by Rs. 10, whereas paraffin wax quoted by Rs. 15 due to reduced arrivals. Turnover was normal.

In the absence of demand by local and upcountry traders as well as nervous offerings by stockists, tartaric acid crushed by Rs. 75 at Rs. 7000 per 50 kg. Sodium nitrite declined sharply by Rs. 45 at Rs. 800/805 in the absence of enquiries.

Rangolite Germany tumbled down by Rs. 10 at Rs. 70 in view of poor buying interest shown by gur khandsari makers. Sufolight and chatkolight ruled quiet at Rs. 50 each per kg.

Titanium dioxide Anatase cheaper by Rs. 1.50 at Rs. 50 on poor demand by millers due to extreme heat. Titanium dioxide RC-822 ruled quiet at Rs. 64. Acid slurry soft turned easy by Re. 1 at Rs. 22 on withdrawal of support, whereas hard ruled static at Rs. 30.

Formaldehyde marked up by Rs. 1.50 at Rs. 8.00 per kg. on tight supply position. Paraffin wax advanced by Rs. 15 at Rs. 590 on tight supply and good demand. Soda ash increased by Rs. 5 at Rs. 265/295 per bag on good seasonal consumption. Ammonia bicarb ruled static at Rs. 118. Soda bicarb Tata moved up by Rs. 10 at Rs. 265 owing to restricted offerings and good demand, whereas soda bicarb NAL softened by Rs. 5 due to improved supply. Boric acid technical eased by Rs. 5 owing to poor enquiries. Borax crystal declined by Rs. 5.

Glycerine reacted downward by Rs. 1/2 at Rs. 42/43 due to poor seasonal consumption. Ammonium chloride Sahu lost Rs. 5 at Rs. 180. Menthol flake, medium and bold declined from Rs. 180, Rs. 197 and Rs. 207 to Rs. 165, Rs. 182 and Rs. 192 per kg. respectively owing to stockist selling, but at the weekened on fall in arrivals its prices improved and closed at Rs. 175, Rs. 190 and Rs. 200. Mentha oil ruled static at Rs. 140. DMO was quoted at Rs. 70.

Dull trading prevailed in dyes and colours.

(DELHI MARKET RATES AS ON APRIL 15, 1988)

Ammonia Bicarb (per 25 kg)	118.00
Mercury (per flask)	9000.00
Soda ash (per bag)	260-295.00
Ammonium chloride (per 50 kg)	115-180.00
Caustic soda solid	No Stock
Caustic soda flakes (per 50 kg.)	400-405.00
Citric acid (per 50 kg)	2300-2550.00
Stable Bleaching Powder Shriram (per 25 kg)	95.00
Stable Bleaching Powder KCI (per 25 kg)	85.00
Stable Bleaching Powder MODI (per 25 kg.)	90.00
Sod. Bicarbonate (per 50 kg.)	265-275.00
Sod. Hydro Sulphite (per kg)	34.50-36.50
Rangolite (per kg)	50-70.00
Boric acid Technical (per 50 kg)	980.00
Paraffin wax (per 50 kg)	590.00
Tartaric acid (per 50 kg)	7,000.00
Borax Granular (per 50 kg)	570.00
Borax Crystal (per 50 kg)	575.00
Sodium Nitrate (per 50 kg)	440-450.00
Sodium Nitrite (per 50 kg)	800-805.00
Camphor Powder (per kg)	88.00
Camphor Thal (per kg)	99.00
Menthol Medium (per kg)	200.00
Menthol Flakes (per kg)	175.00
Menthol Bold (per kg)	200.00
Glycerine (per kg)	42-43.00
Sodium Silicate (per quintal)	200-250.00
Hexamine (per kg)	40.00
Acetic Acid Glacial (per kg)	13-13.50
Copper Sulphate (per quintal)	1800-2100.00
Formic acid (per kg)	29.00
Formaldehyde (per kg)	8.00
Hydrogen Peroxide (per kg)	33-34.00
Calcium Carbonate (per tonne)	3500-4000.00
Acid Slurry Soft (per kg)	22.00
Acid Slurry Hard (per kg)	30.00
Phosphoric Acid (per 50 kg)	825.00
Pot. Nitrate (per quintal)	900-1200.00
Pot. Permanganate (per 50 kg)	2300.00
Sod. Bichromate (per 50 kg)	1025-1125.00
Tri-Sod. Phosphate (per 50 kg)	340-350.00
Titanium Dioxide Anatase (per kg)	51.00
Titanium RC-822 (per kg)	64.00
Zinc Oxide (per mt)	32000-38000.00
Phenol Carbolic Acid (per kg)	33.00
Carbon Tetrachloride (per kg)	17.50
Chloroform (per kg)	26.00
Sodium Sulphate (per 50 kg)	155-158.00
Naphthalene Balls (per 50 kg)	1400.00

DYES & COLOURS	per kg
Naphthol AS	150.00
NaphtholASG	235.00
Naphthol ASBS	200.00
Naphthol ASTR	302.00
Naphthol ASOL	191.00
Naphthol ASBO	208.00

DIRECT DYES	(per kg)
Black E. Conc.	92-155.00
Diazo Black B.T.	125.00
Green B.	119.00
Blue 2-B	86.00
Sky Blue FB	200.15
Basic Auramine 'O' Conc.	65-100.00
Basic Rohdamine B. 500%	220-320.00
Basic Methylene Blue	92-130.00
Basic Violet	142-160.00
Basic Malachite Green	160-185.00
Acid Orange	45-52.00

Madras Market

Dull to moderate conditions prevailed in the market. MMTC had announced further steep increase in the prices of Nickel metal this week. Menthol prices declined on account of poor demand and increased arrivals.

(MADRAS MARKET RATES AS ON APRIL 16, 1988)

Acetic Acid — Glacial (per kg.)	17.00
Acid Slurry (Soft) (per kg)	26.00
Aluminium Sulphate Iron free (per tonne)	1,700.00
Ammonium Bi-carbonate (per 25 kg.)	125.00
Ammonium Chloride SPIC (per tonne)	1800.00
Bleaching Powder — Mettur (per 25 Kgs. bags)	100.00
Borax Granular	640.00
Cresylic Acid 100% (per kg.)	85.00
Meta Cresol 40/42% (per kg.)	47.00
Para Cresol 80%/85% (per kg.)	55.00
Caustic Soda Flakes (Mettur) (per ton)	8200.00
Caustic Soda Flakes (Andhra sugar)	8200.00
Citric Acid — Indian (per kg)	42.00
Copper Sulphate (per 50 kg.)	1000.00
Formic Acid (India) (per kg.)	27.00
Formaldehyde (par kg.)	7.00
Glycerine (per kg)	42.00
Hydrosulphite of Soda TCPL (per kg.)	33.00
Hydrosulphite of Soda IDI (per kg)	36.00
Hydrosulphite of Soda BASF (per kg.)	38.00
Hydrogen Peroxide (India) (per kg.)	35.00
Hyflo Supercell	19.00
Magnesium Carbonate Light	18.00
Potassium Bichromate (per kg.)	24.00
Phosphoric Acid (per kg)	18.00
Phthalic Anhydride (per kg)	28.00
Pentaerythritol (per kg)	52.00
Paraffin Wax (per kg)	13.50
Oxalic Acid (per kg.)	20.00
Soda Ash (TAC) (per 75 kg)	325.00
Soda Ash (TATA) (per 75 kg)	325.00
Sodium Cyanide Indian (per kg.)	47.00
Sodium Cyanide Degussa (per kg.)	75.00
Sodium Bichromate (per kg)	19.00
Sodium Bicarbonate (per 50 kg.)	280.00
Sodium Nitrite (per 50 kg.)	640.00
Sodium Nitrate (per 50 kg.)	425.00
Sodium Silicate (per tonne)	4000.00
Sodium Sulphate (per tonne)	3500.00
Sodium Sulphide Flakes (per tonne)	13,000.00
Sodium Bi-sulphite (per 50 kg.)	185.00
Stearic Acid (per kg)	32.00
Trisodium phosphate (per 50 kg)	345.00
Titanium Di-oxide Indian TTP (per kg.)	54.00
Titanium Di-oxide Indian Rutile (per kg)	60.00
Urea Tech (per tonne)	2800.00
Zinc Oxide (per kg.)	34.00
Zinc Chloride Powder (per kg.)	13.00
Zinc Sulphate (per tonne)	4,200.00
Di-octyl phthalate (per kg.)	47.00
Di-butyl phthalate (per kg.)	47.00

SOLVENTS

Acetone (H.O.C.) (per kg.)	19.00
Isopropyl Alcohol NOCIL (per kg.)	21.50
Diacetone Alcohol NOCIL (per kg.)	28.50
Benzene SAIL (per kg)	15.00
Diethylene Glycol NOCIL (per kg)	33.00
Butanol NOCIL (per kg.)	35.00
Butanol NOCIL (per kg.)	33.50
Toluene SAIL (per litre)	13.00
Xylene IPCL (per litre)	15.00
Phenol HOC (per kg.)	28.00
Turpentine (per litre)	16.50
Sorbitol (per kg.)	30.00
Trichloroethylene MCIC (per kg)	23.50
Carbon Tetra Chloride (per kg)	15.40
Chloroform (per kg)	24.00
Methylene chloride (per kg)	23.00
Methyl Ethyl Ketone (per kg.)	42.00
Cellosolve (per kg.)	52.00
Triethanolamine (per kg.)	23.00
Ethyl Acetate (per kg.)	22.00
Butyl Acetate (per kg)	40.00

MATERIALS IMPORTED

(Contd. from previous issue).

BOMBAY
(From 29.12.87 to 4.1.88)

PERCHLOROETHYLENE : From Finland : United Pulp of Paper Mills Ltd., 19.200 kgs., Rs. 1,52,515/-; From Brazil : Tamilnadu Dadha Pharmaceuticals, 20,460 kgs., Rs. 1,48,980/-.

PEROXY ACETIC ACID : From Germany : Oblum Electrical Industries P. Ltd., 3,000 kgs., Rs. 1,60,058/-.

PHENOL USP : From Australia : Nav Maharashtra Chakan Oil Mills, 48,000 kgs., Rs. 6,25,948/- From Germany : Bharat Heavy Electricals Ltd., 50 Mts., Rs. 6,28,861/-; From China : P. K Enterprises, 1,09,200 kgs., Rs. 13,83,575/-; From Japan : Voltas Ltd., 33,400 kgs., Rs. 4,93,132.19 ; From Spain : The Raymond Woollen Mills Ltd., 46.800 Mts., Rs. 6,19,592.64.

PHTHALIC ANHYDRIDE : From Iran : Kanwal Enterprises, 8,000 kgs., Rs. 74,139/-.

POLYVINYL ALCOHOL : From U.S.S.R. : The State Trading Corporation of I. Ltd., 1,000 kgs., Rs. 21,183/-.

POTASSIUM CARBONATE : From Germany : University of Bombay, 17,500 kgs., Rs. 1,22,793/-.

POTASSIUM HYDROXIDE : From Czechoslovakia : Excel Industrial Gears P. Ltd., 5,000 kgs., Rs. 45,338/-.

PROMETHAZINE HCL BP : From Germany : National Fertilizer Ltd., 100 kgs., Rs. 41,902/-.

PROPIONIC ACID : From Finland : Liring Media Industries P. Ltd., 16,380 kgs , Rs. 1,87,093/-.

PROPYLENE GLYCOL : From U.K. : The Universal Trunk Factory, 8.385 kgs., Rs. 91,029/-:

PYRIDINIUM M-PROPYL SULPHOBETAINE : From France : Rollatainers Ltd., 1,000 kgs., Rs. 1,83,146/-.

PYRIMETHAMINE BP 80 : From Finland : Newsprint Trading & Sales Corporation, 100 kgs., Rs. 34,422/-.

ROCK PHOSPHATE : From Japan : Tata Exports Ltd., 2,000 kgs., Rs. 13,92,768/-.

SILICON METAL : From U.S.A. Muhamad Mahmood Bin, 20,000 kgs., Rs. 3,17,739.82; From Sweden : Century Pulp & Paper, 20.000 kgs., Rs. 3,17,739.82 : From U.K. : IVP Ltd., 20,000 kgs., Rs. 3,29,347/-.

SILICONE EMULSION : From Japan : Uptron Capacitors Ltd., 1,560 kgs., Rs. 74,469.

SODIUM ALGINATE : From Japan : Indian Engineers, 7,800 kgs., Rs. 2,53,000/-; Verb Chemical Industries, 5,200 kgs., Rs. 1,68,667/-.

SODIUM CHLORATE : From Belgium : Morris Electronics Ltd., 21,268 kgs., 1,35,154/-; From Germany : Sigma Paints Ltd., 63,644 kgs., Rs. 4,04,445/-.

SODIUM METHOXIDE POWDER : From Japan : Cochin Refineries Ltd., 2,993.74 kgs., Rs. 1,47,390/-.

SODIUM METHYLATE : From China : Jupiter Orga P. Ltd., 9,000 kgs., Rs. 3,97,013/-.

SOYA LECITHIN : From Japan : Shriram Foods & Fertiliser Industries, 15 Mts., Rs. 97,375/-. From Iraq : Sidiki Trading Co., 10 kgs., Rs. 64,916.22. From U.S.S.R. : Bharat Heavy Electricals Ltd., 5,000 kgs., Rs. 33,098/-.

SODIUM TETRAPHENYL BORATE GR : From Japan : Uttam Galva Steel Ltd., 1 Ltr., Rs. 598/-.

STRONTIUM CHROMATE : From Spain : Jaypee Export P. Ltd., 20 kgs., Rs. 1,676/-.

SYNTHETIC RED IRON OXIDE : From U.S.A. : Precision Micrographics, 20,000 kgs., Rs. 54,955/-.

TERTIARY DODECYL MERCAPTAN : From U.S.A. : P. C. Jain Sons, 180 kgs., Rs. 7,025/-.

TETRAMETHYL THIURAM DISULPHIDE : From G.D.R. : R. R. Enterprises, 6,000 kgs., Rs. 78,585/-.

THIOACETIC ACID : From Canada: Sandesh Ltd., 400 kgs., Rs. 94,212/-.

THIOPHOSPHORYL DIETHYL CHLORIDE : From Denmark : Priya Chemicals, 32,850 kgs., Rs. 10,43,775.20.

THEOPHYLLINE ANHYDROUS BP 80 : From Germany : Vijay Oil Mills, 4,000 kgs., Rs. 5,03,088/-.

3,4,5, TRIMETHOXY BENZALDEHYDE : From Germany : Amrit Banaspati Co. Ltd., 1,020 kgs., Rs. 3,24,094.62.

TITANIUM DIOXIDE RUTILE GRADE : From U.S.A. : Cummins Diesel Sales & Service, 16 MT, Rs. 4,67,077.

TOLUENE DI ISOCYANATE : From Czechoslovakia : Dewandchand Dholandas & Co., 3,000 kgs., Rs. 85,392.57.

TRICHLORO . TRIFLUORO ETHANE : From Sweden : Bharat Heavy Electricals Ltd., 6,000 kgs., Rs. 1,84,328/-.

TRICYCLODECANE DIMETHYLOL AROMATIC CHEMICALS : From Germany : Hindustan Lever Ltd., 1,620 kgs., Rs. 2,82,659/-.

TRIETHYLAMINE : From Japan : Uttam Galva Steel Ltd., 1 Ltr., Rs. 1,981/-.

TRIETHYLENE GLYCOL : From Taiwan : Southern Sea Foods P. Ltd., 2.925 kgs., Rs. 38,378/-.

TRI ISOBUTYL ALUMINIUM : From U.S.A. : Kirloskar Cummins Ltd., 1.600 Mts., Rs. 1,79,223/-.

TRI ETHYL ALUMINIUM : From U.S.A. : Kirloskar Cummins Ltd., 4 Mts., Rs. 4,63,379/-.

TRIMELLITATE ESTER : From Germany : The Atul Products Ltd., 3,510 kgs., Rs. 1,72,483.63; Zam Zam Tanners, 4,400 kgs., Rs. 1,52,382/-.

TRIMETHOXYBENZALDEHYDE MINIMUM 99% : From Korea : Iberia Organics P. Ltd., 1,000 kgs., Rs. 2.68,755/-.

2,3,6 TRIMETHYL PHENOL : From Germany : Super Trade Enterprises, 2,470 kgs., Rs. 2,21,807/-.

TRI OCTYL TRI MELLITATE : From U.K. : Pacific Engineering Works P. Ltd., 7.570 Mts., Rs. 1,98,436.45.

TUNG OIL : From Spain : Jaypee Export P. Ltd., 16.5 kgs., Rs. 1.274/-.

2.6 XYLIDINE : From Yugoslavia : Crompton Greaves Ltd., 2,000 kgs., Rs. 2,71,944/-.

XYLIDINE : From Brazil : Hyderabad Polymers P. Ltd., 1,000 kgs., Rs. 1,29,351/-.

XYLENOL 50 : From U.S.A. : R. K. Traders, 46,800 kgs., Rs. 6,07,201/-; From Sweden : The National Newsprint & Paper, 46,800 kgs., Rs. 6,07,201/-.

ZINC ASH : From Germany : Hindustan Ciba Geigy Ltd., 54.890 Mts., Rs. 3,51,149/- ; From Yugoslavia : Harkab Holdings P. Ltd., 42.980 Mts., Rs. 1.71,275/-.

BOMBAY
(From 5.1.88 to 7.1.88)

ACRYLAMIDE : From Japan : G.S.A. (India), 15 MT., Rs. 2,92,123; From Japan : Colour-Chem Ltd., 11,700 kgs., Rs. 2.35,451; From FRG : Falcon Gulf Ceramics Ltd., 2,040 kgs., Rs. 44,563.

ALPHA AMYLASE ENZYME : From UK : Himson Textile Engg. P. Ltd., 150 kgs., Rs. 13,702.

ALUMINIUM OXIDE SYNTHETIC WHITE : From France : Rallis India Ltd., 1,700 kgs., Rs. 55.468.

p-AMINO BENZAMIDE : From Singapore : Dr. Beck & Co. (I) Ltd., 200 kgs., Rs. 66,255.

AMINO ANISIC ACID ANILIDE : From Japan : Colour Chem Ltd., 1,000 kgs., Rs. 3.30,750.

AMMONIUM PERSULPHATE: From FRG: S. D. Fine Chemicals P. Ltd., 2,000 kgs., Rs. 31,159.79.

AROMATIC CHEMICALS: From UK: Larsen & Toubro Ltd., 50 kgs., Rs. 79,047; From USA: Kanhyalal Diwarkanath, 300 kgs., Rs. 1,11,116; Anant Agarbathi Works, 246.4 kgs., Rs. 50,266; From FRG: Sahney Kirkwood P. Ltd., 950 kgs., Rs. 3.05,973.

ANTIMONY TRIOXIDE: From Denmark: Rajaram & Brothers, 2,000 kgs., Rs. 1,37,687.

BARIUM CARBONATE: From FRG: Pieco Electronics & Electricals Ltd., 1,000 kgs., Rs. 10,104.

BASIC BISMUTH CARBONATE: From Belgium: Asian Electronics Ltd., 125 kgs., Rs. 24,663.

BENZOYL CHLORIDE MIN. 99% PURITY: From FRG: Modi Rubber Ltd., 1,920 kgs., Rs. 38,-756.

BISPHENOL A: From Brazil: Zenith Ltd., 5 mts., Rs. 70,718; From Taiwan: Thermax P. Ltd., 50,000 kgs., Rs. 6,94,811; From Brazil: Cibatul Ltd., 50,000 kgs., Rs. 6,49,811; Zenith Ltd., 5 mts., Rs. 70,718; 5 mts., Rs. 70,718; 5 mts., Rs. 70,718.

t-BUTANOL: From USA: Indmag P. Ltd., 12 mts., Rs. 2,41,-044.

CALCIUM LIGNO SULPHONATE: From Norway: Silicon Carbide Grinding Mills, 12,000 kgs., Rs. 60,512.

CARBON BLACK: From UK: Kolhapur Steel Limited, 1,200 kgs., Rs. 1,88,581; From Mexico: Plastotex Fortrusion & Mould P. Ltd., 1,360.8 kgs., Rs. 55,605. From UK: Singh Electro Steel Ltd., 1,200 kgs., Rs. 1,86,218; From Japan: Steel Deal, 1,200 kgs., Rs. 1,86,218.

CARBARYL 99%: From UK: New India Marine Works, 18,000 kgs., Rs. 8,60,010.

CATALYST (STANNOUS OCTATE): From Japan: U.K. Paint Inds., 300 kgs., Rs. 22,686.

CATALYST (TRIETHYLENE DIAMINE): From Japan: U.K. Paint Inds., 400 kgs., Rs. 64,593.

CELLOSOLVE ACETATE: From USA: The New Vinod Silk Mills P. Ltd., 2,600 kgs., Rs. 45,-414.35.

CERAMIC COLOURS: From UK: Madhusudan Vegetable Products, 400 kgs., Rs. 45,146.

CHLORETHOXYETHANOL : From Sweden: Parag Pharmls. (I) P. Ltd., 240 kgs., Rs. 74,787.

2 - CHLORO - 5 - TOLUIDINE 4 - SULPHONIC ACID: From Japan: Sudarshan Chemicals Industries, 12,800 kgs., Rs. 6,93,-261.

CHLOROQUINE PHOSPHATE : From Singapore: Electronics Con-

sortium P. Ltd., 1,000 kgs., Rs. 3,11,120.

CHLORPROMAZINE HCL : From China : Godama Laboratories, 100 kgs., Rs. 45,441.

CLOVE OIL : From China : The Atul Products Ltd., 1,000 kgs., Rs. 31,112 ; From Madagascar: S. H. Kelkar & Co. Ltd., 5,500 kgs., Rs. 2,45,-128; From Japan: Amar Synthetics, 1,100 kgs., Rs. 36,817.

CRUDE EUGENOL 99%: From Czechoslovakia: United Hardware & Mill Stores, 200 kgs., Rs. 10,432.

CYANOPYRAZINE: From Iraq: Vishal Enterprises, 1,000 kgs., Rs. 5,63,274.

CYANURIC CHLORIDE: From Australia: Akay Industries, 500 kgs., Rs. 21,662; From Japan: Shyam Dyes & Chemicals Inds., 500 kgs., Rs. 21,662; Chemix Works, 500 kgs., Rs. 21,662; From FRG: Ace Turnkey Fire Protection Ltd., 500 kgs., Rs. 21,662; Jaysynth Dyechem Pvt. Ltd., 29,650 kgs., Rs. 13,28,-735.

D. FRUCTOSE: From FRG: S. D. Fine Chemicals P. Ltd., 750 kgs., Rs. 22,155.

4, 4-DIAMINO BENZENANILIDE : From Japan : P.N. Dhoot Investment Co. P. Ltd., 2,000 kgs., Rs. 5,49,190.

DIBUTYL TIN OXIDE: From Pakistan: Bharat Overseas Impex, 1,080 kgs., Rs. 1,53,399; From Japan: Hims Electronics, 1,600 kgs., Rs. 2,39,469.

DIETHYL AMINO ETHYL AMINE: From Japan: Dr. S. K. Miglani, 320 kgs., Rs. 63,482.

DIETHYLENE DIAMINE: From Japan: The Bhor Inds. Ltd., 14,440 mts., Rs. 4,02,026.

DIETHYLENE DIAMINE: From France: Ingersoll Rand (I) Ltd., 6,914 kgs., Rs. 1,86,715; From Sweden: Parag Pharml. (I) Pvt. Ltd., 3,990 mts., Rs. 1,11,086.

DIETHYLENE GLYCOL MONOETHYL ETHER: From Italy: IPCL, 4,940 kgs., Rs. 55,591.

DIMETHIONINE (FEED GRADE): From Belgium: Godrej Soaps Pvt. Ltd., 3,000 kgs., Rs. 1,16,849.

DIMETHYLENE GLYCOL DIMETHYL ETHER: From Canada: National Newsprint & Paper Mills Ltd., 2,535 kgs., Rs. 1,15,262.

DIMETHYL ETHANOLAMINE: From UK: Bharat Electronics Ltd., 3,240 kgs., Rs. 98,659.

DIMETHYL SULFOXIDE: From Japan: Armour Chemical P. Ltd., 2,495 kgs., Rs. 57,841; From FRG: Gujarat State Exports Corporation, 5,000 kgs., Rs. 52,362; From Japan: Bombay Drug & Pharmas P. Ltd., 2,640 kgs., Rs. 61,696.

DIMETHYL TEREPHTHALATE: From Yugoslavia: Aegian Offset Printer, 2,500 mts., Rs. 1,97,78,-641.

t-DODECYL MERCAPTAN: From Japan: Swan Thermometers Ltd., 875 kgs., Rs. 15,904.

EDIBLE SOYA LECITHIN (FOOD GRADE): From Brazil: Britannia Inds. Ltd., 20,000 kgs., Rs. 1,35,026.

EMULSIFIABLE POLYETHYLENE : From Japan : Lalbhai Export Ltd., 1,000 kgs., Rs. 21,183.

ENZYMES : From FRG : Goa Shipyard Ltd., 710 kgs., Rs. 79,297 ; From USA : J.C.B. Controls : 1,778 kgs., Rs. 1,66,082.

EPICHLORCHYDRIN : From Taiwan : Shah & Co., 5,040 kgs., Rs. 1,14,512.

ETHOXY CARBONYL PROPIONYL CHLORIDE : From USSR : Patni Bros. P. Ltd., 1 mts., Rs. 2,79,538.

ETHYL CELLULOSE : From Cuba : Dujodwala Resins & Terpenes, P. Ltd., 1,020 mts., Rs. 1,35,238.

ETHYL PYRROLIDONE ACETATE : From Sweden : Parag Pharml. (I) P. Ltd., 600 kgs., Rs. 2,53,486.

ETHYL VANILLIN : From FRG: Press Metal Corpn. Ltd., 200 kgs., Rs. 55,604.

FORON BRILLIANT BLUE : From Japan : Tsuneyoshi Karaksa, 1,000 kgs., Rs. 5,65,311.46.

FINISHING OIL : From Japan : Indian Petrochemicals Corpn. Ltd., 21,600 mts., Rs. 6,77,546.

FULLY RESINED PARAFFIN WAX : From Morraco : Ganesh International, 2,43,040 kgs., Rs. 22,45,382.

FURFURYL ALCOHOL : From Belgium : Ranbaxy Labs. Ltd., 2,480 kgs., Rs. 52,972.

GILSONITE : From FRG : Precision Bearing Ltd., 8,732 kgs., Rs. 57,609.

GLYCERINE BP : From Canada : Lok Bharatni, 5,000 kgs., Rs. 89,364.

GLYCOL ETHER : From Belgium: Asian Electronics Ltd., 4,750 kgs., Rs. 53,055; From Hongkong: SRSK Chemicals, 4,950 kgs., Rs. 55,591.

GUM ROSIN N' GRADE: From USA: U. D. International, 17.55 mts., Rs. 1,16,174; From Finland: Vindhya Paper Mills Ltd., 2.925 mts., Rs. 21,340.

GUM ROSIN WW GRADE: From Indonesia: Satis Rosin & Turpentine Works, 18 mts., Rs. 1,20,355; Resins and Plastics Ltd., 36,000 kgs., 2,29,024; From Japan: Kirloskar Oil Engines Ltd., 18 mts., Rs. 1,13,438; From China : Sangamner Bhag SSK Ltd., 31,950 mts., Rs. 21,-995; From Hongkong: Sangamner Bhag SSK Ltd., 99 mts., Rs. 68,155.

Sangamner Bhag SSK Ltd., 99 mts., Rs. 68,155.

HYDROGEN PEROXIDE: From Spain: Usha Chemical Co., 4,200 kgs., Rs. 36,372.

HYDROGEN PEROXIDE 50%: From Spain: Usha Chemical Co., 4,200 kgs., Rs. 36,372; 8,400 kgs., Rs. 72,744; Kapi Chem Dye, 16,800 kgs., Rs. 1,45,488.

HYDROSULPHITE CONC.: From FRG : Aichemie, 5,000 kgs., Rs. 56,267; From Singapore: Instrumentation Ltd., 5,000 kgs., Rs. 56,267.

HYDROXYLAMINE HYDROCHLORIDE: From USA: Kirloskar Cummins Ltd., 500 kgs., Rs. 32,737.

HYDROXYLAMINE SULPHATE: From Afghanistan: Mukesh & Co., 18,000 kgs., Rs. 4,91,324; From UK: Dinesh Rubber Inds., 6,000 kgs., Rs. 1,34,253.

IODINE CRUDE: From Indonesia: MMTC of India Ltd., 2,500 kgs., Rs. 5,84,246; From Japan: Bharat Chemicals & Ayurvedic, 2,000 kgs., Rs. 4,76,610; From FRG: Caprihans India Ltd., 1,000 kgs., Rs. 2,40,953; From Iran: Sarala P. Jain: 5,400 kgs., Rs. 12,86,846.

ISOBORNYL ACETATE: From USA: Multi Films Plastics Pvt. Ltd., 25 mts., Rs. 3,77,813; From FRG: Dujodwala Inds., 25 mts., Rs. 3,77,813; From FRG: Dujodwala Inds., 25 mts., Rs. 3,77,813.

ISOBUTANOL: From UK: Arav Enterprises, 6,396 kgs., Rs. 55,377; From USA: The New Vinod Silk Mills P. Ltd., 1,155 kgs., Rs. 13,718.

ISOBUTANOL 98%: From Switzerland: Universal Inds. Mfg. Co., 6,396 kgs., Rs. 55,377.

ISO BUTYL ACETATE: From USA: Super Book House, 14,400 kgs., Rs. 1,47,697.

ISO CAMPHYL CYCLOHEXAMOL: From Japan: Nanavati & Co. Pvt. Ltd., 3,000 kgs., Rs. 4,19,306.

ISOCYANATE: From UK: Himson Textile Engg. Inds. P. Ltd., 450 kgs., Rs. 18,796.

ISOPHTHALIC ACID: From Japan: Universal Polymers, 6,000 kgs., Rs. 76,342.

ISOPHTHALIC ACID: From Australia: Indian Tool Mfrs., 7,000 kgs., Rs. 93,609.

ISOPHTHALIC ACID BP: From FRG: May & Baker (I) Ltd., 5,000 kgs., Rs. 52,04,725.

LACTOSE: From FRG: Calama Inds. P. Ltd., 5,000 kgs., Rs. 62,041.

LACTOSE BP/USP: From UK: Dr. Urvashi Prasad Jha, 5,000 kgs., Rs. 60,261.

LANDOLAL: From France: S. H. Kelkar & Co. Ltd., 1,000 kgs., Rs. 2,72,915.

LILIAL: From FRG: Sahney Kirkwool P. Ltd., 5,130 kgs., Rs. 12,39,195.

LINALOOL: From France: Century Enka Ltd., 350 kgs., Rs. 3,69,358.

LINALYL ACETATE: From FRG: Sahney Kirkwood P. Ltd., 4,200 kgs., Rs. 5,60,114.

LUBRICATING OIL (PROPYLENE CARBONATE): From UK: Monark Engg. Corpn., 1,996 kgs., Rs. 56,288.

LYSINE FEED GRADE 98%: From Pakistan: General Seal Co. P. Ltd., 47,100 kgs., Rs. 39,717.

L-LYSINE MONO HCL USP: From Korea: Tata Exports Ltd., 500 kgs., Rs. 33,098.

MALEIC ANHYDRIDE: From Japan: Khatau Junker Ltd., 17,500 mts., Rs. 2,13,575.

MANGANESE CARBONATE : From GDR: Cosmo Ferrites Ltd., 10 kgs., Rs. 89,668.

MEGLUMINE BP: From France: May & Baker (I) Ltd., 200 kgs., Rs. 39,077.

METAXYLENE: From Sweden: Parag Pharml. (I) P. Ltd., 340 kgs., Rs. 38,202.

METHACRYLIC ACID: From FRG: Precision Equipments, 5,000 kgs., Rs. 1,47,234.

METHOXY PROPYLAMINE : From Singapore: Crystal Creations, 3,060 kgs., Rs. 1,79,516.

METHYLENE BIS ORTHO CHLORO ANILINE: From UK: Banco Products (I) Ltd., 160 kgs., Rs. 17,222.

METHYL HYDROGEN POLYSILOXANE: From USA: Amar Ferro Metals P. Ltd., 5,000 kgs., Rs. 1,61,200.

MICROCRYSTALLINE CELLULOSE: From USA: Cipla Ltd., 320 kgs., Rs. 24,055.

MICROCRYSTALLINE CELLULOSE: From USA: Cipla Ltd., 320 kgs., Rs. 24,055.

MICROCRYSTALLINE WAX : From USA: Richardson Hindustan Ltd., 14.144 mts., Rs. 2,57,089.

MOLYBDENUM DISULPHIDE : From FRG : Indian Oil Corpn. Ltd., 3,000 kgs., Rs. 3,49,054.78.

METHYLENE GLYCOL (FIBRE GRADE) : From Singapore : Dr. Beck & Co. Ltd., 56,400 kgs., Rs. 4,39,353 ; From USA: Polyset Plastics P. Ltd., 18,800 kgs., Rs. 1,46,451.

MORPHOLINE: From Netherland: Hindustan Lever Ltd., 5.0077 mts., Rs. 1,30,273.

NN DIMETHYL ANILINE: From UK: Mohit Traders, 1,980 kgs., Rs. 92,873.

NATURAL ESSENTIAL OILS: From Netherland: Ghatge Patil Inds. Ltd., 111 kgs., Rs. 21,955; From Malaysia: Moraco, 100 kgs., Rs. 11,880; From Brazil: Gogia Chemical Inds., 6,920 kgs., Rs. 83,618.

NATURAL OLEO PINE RESIN: From Italy: Sakthi Sugars Ltd., 81,375 kgs., Rs. 4,91,702.

NORMAL BUTANOL: From UK: Goodlass Nerolac Paints Ltd., 26,520 kgs., Rs. 2,97,833.

NOVALDIAMINE: From Australia: Sigampora Bros., 1,980 kgs., Rs. 6,04,538; From FRG: IPCA Labs. P. Ltd., 1980 kgs., Rs. 6,25,317.

OCTAMETHYL CYCLOTETRASILOXANE: From USA: Reliance Silicones (I) Ltd., 7,800 kgs., Rs. 2,78,491.

ORANGE OIL: From Indonesia: Ranjan Agarbathi Works, 102 kgs., Rs. 62,423.

ORGANIC SURFACE ACTIVATED AGENTS: From FRG: Tata Engineering & Locomotive, 1,710 kgs., Rs. 1,91,610.

PARA FORMALDEHYDE: From UK: Delhi Book Store, 36,000 kgs., Rs. 1,91,176; From FRG: Lucky Plastic Inds., 18,000 kgs., Rs. 93,480; From Japan: PDI Chemicals P. Ltd., 16,000 kgs., Rs. 97,634.

PARA OCTYL PHENOL: From Japan: Atsuan Chemical Corpn., 2,000 kgs., Rs. 41,546.

PARA XYLENE: From Turkey: Bombay Dyeing & Mfg. Co. Ltd., 29,93,607 kgs., Rs. 1,36,08,127.

PATCHOULI OIL: From UK: Centron Inds. Alliance Ltd., 2,010 kgs., Rs. 1,94,258.

PENICILLIN G. POTASSIUM FIRST CRYSTALS: From UK: Hindustan Antibiotics Ltd., 10,-800 units, Rs. 27,69,979.

PEPSIN: From Belgium: Atlas Capco Ltd., 500 kgs., Rs. 49,647. From Denmark; Aristo Pharmaceuticals P. Ltd., 500 kgs., Rs. 51,302.

PERCHLORO ETHYLENE: From Netherlands: Godfrey Phillips India Ltd., 19,840 kgs., Rs. 1,36,-563; From FRG: Sumitomo Resins & Chemicals Ltd., 5,280 kgs., Rs. 37,018; From Saudi Arabia: Ecoplast P. Ltd., 20,460 kgs., Rs. 1,39,858; From Taiwan: Yash Udyog, 11,530 mts., Rs. 86,647; From FRG: C. D. Corporation, 5,280 kgs., Rs. 37,018; From Belgium: Anshul Chemicals P. Ltd., 24,460 kgs., Rs. 1,46,101; Bharat Chemicals P. Ltd., 10,230 kgs., Rs. 70,394.

PHENOL: From Japan: BASF India Ltd., 50,000 kgs., Rs. 6,29,-688.

PHENOL USP: From Japan: Ficom Organics Ltd., 50,000 kgs., Rs. 6,16,704; 50,000 kgs., Rs. 6,16,704; Alta Laboratories P. Ltd., 50,000 kgs., Rs. 6,16,-704.

PHTHALATE PLASTICIZER : From Srilanka : Zanen Vertacep N.V., 8,080 kg., Rs. 1,17,178.

PINECHEM TERPENEOL : From Australia : Saravanabava Mills P. Ltd., 2,730 kgs., Rs. 43,372.

POLYETHYLENE WAX: From Japan: Beta Plastics, 5,000 kgs., Rs. 7,875.

POLYOLS: From Canada: White Cloud Filter Pads P. Ltd., 58.8 mts., Rs. 12,97,805.

POLYURETHANE VARNISH: From FRG: Naresh Udyog, 600 kgs., Rs. 29,090.

POLYVINYL ALCOHOL: From Netherlands: Peico Electronics & Electricals, 5,000 kgs., Rs. 1,05,-913; From Japan: Kopi Chem Dye, 5 mts., Rs. 1,03,870; From USA: Ballarpur Inds. Ltd., 12 mts., Rs. 2,36,035; Haryana Coated Papers Ltd., 6,000 kgs., Rs. 1,18,018; From Japan: Triveni Chemicals P. Ltd., 11 mts., Rs. 2,42,786; Daily Jognan, 3,375 kgs., Rs. 69,257; From Brazil : Hitkari Potteries P. Ltd., 9.12 mts., Rs. 1,81,111; From Japan: Hindi Fabrics Wvg. Factory, 5,000 kgs., Rs. 1,10,358; From Italy : Godrej & Boyce Mfg. Co. Pvt. Ltd., 5 mts., Rs. 1,10,358.

POTASSIUM CARBONATE PHOTO GRADE: From Japan: India Photographic Co. Ltd., 17,766 kgs., Rs. 1,26,100.

POTASSIUM CYANIDE: From China: Tejoomals, 3,600 kgs., Rs. 90,556.

POTASSIUM SORBATE: From Netherland: Indian Plastics Ltd., 400 kgs., Rs. 42,002.

POVIDONE IODINE: From U.S.A. : Wockhardt Ltd., 2000 kgs., Rs. 4,07,629.

PRECIPITATED SILICA : From Taiwan : Industrial Oil Traders, 6.040 MTS., Rs. 49,191.

PROPIONIC ANHYDRIDE : From Saudi Arabia : Subh Plastics, 1,080 kgs., Rs. 39,981.

PYRENE 96% : From U.S.A. : Century Rayon, 100 kgs., Rs. 26,783.

PYRIDINE BASE : From UK : Sterling Enterprises, 4,680 kgs., Rs. 1,63,492.

RANGOLITE DS : From USA : Cheminova Inds. P. Ltd., 2,564.10 kgs., Rs. 1,84,611.

ROCK PHOSPHATE : From Korea : Hariram Gobindram, 2,000 MT., Rs. 13,75,429.

SILICON METAL : From Rochester : Phoenix Metals & Alloys P. Ltd., 20 MTS., Rs. 3,23,283.

SODIUM ALGINATE : From USA : Wadia, 825 MT., Rs. 1,53,309.

SODIUM DICHROMATE : From Japan : Jams Engineering P. Ltd., 12.69 MT., Rs. 1,55,926.

SODIUM LAURYL SULPHATE : From Spain : Modi, Inds. Ltd., 15,000 kgs., Rs. 3,07,810.

SOLVENT NAPHTHA : From Thailand : Indira International Traders, 105.8 kgs., Rs. 5,97,749.

SOLVENT IPA ; From FRG : Sona Steel Inds., 7,144 kgs., Rs. 1,06,876; From USA : Amar Freet Enterprises P. Ltd., 14,288 kgs., Rs. 2,13,752.

SOYALECITHIN : From Brazil : A.S. Corpn., 15 MTS., Rs. 97,314.35.

SPIN FINISH OIL : From

France : Upcon Cables Ltd., 3.06 MTS., Rs. 1,45,057.

STARCH ETHER : From Switzerland : Hindustan Brown Boveri, 1,000 kgs., Rs. 16,070.

STEARYL METHACRYLATE : From France : Indofil Chemical Ltd., 13,500 kgs., Rs. 4,09,012.

STRONTIUM CARBONATE : From Belgium : Asian Electronics Ltd., 150 kgs., Rs. 2,987.

STYRENE MONOMER : From Italy : The Premier Automobiles Ltd., 7,410 kgs., Rs. 1,36,362 ; From Netherlands : PDI Chemicals P. Ltd., 7,410 kgs., Rs. 1,36,632.

SUCRALFATE : From China : Aditi Sales Corpn., 500 kgs., Rs. 81,145.

TERTIARY BUTYL ALCOHOL: From FRG : Roche Products Ltd., 6,045 kgs., Rs. 1,21,902.

TITANIUM DIOXIDE RUTILE : From FRG : Vibgyor Distributors, 30,000 kgs., Rs. 7,74,491; From Netherlands : Cadila Labs. P. Ltd., 16,000 kgs., Rs. 4,67,078.

TOLUENE DIISOCYANATE : DESMODER : From Belgium : Macneill & Magor Ltd., 19,512 kgs., Rs. 5,12,355.

TOLUENE DI ISOCYANATE : From UK : Antler Electronics, 19,000 kgs., Rs. 5,15,665.

TRICHLORO TRIFLORO ETHANE : From Japan : Indian Dyestuff Inds., 1,000 kgs., Rs. 44,926.

TRIETHYL AMINE : From Singapore : Printweil, 3,640 kgs., Rs. 73,251.

TRI ETHYLENE GLYCOL : From Taiwan : M.J. Exports P. Ltd., 4,950 MTS., Rs. 62,982.

TRIMELLITIC ANHYDRIDE : From Indonesia : Bharat Glass Inds., 2,250 lbs., Rs. 32,134, From USA : Dr. Beck & Co. Ltd., 16,329 kgs., Rs. 4,81,419.

XYLENES : From Taiwan : U.P. Export Corpn. Ltd., 4 Litres, Rs. 411.

XYLENOL 98% : From FRG : Ritu Minerals Inds. Ltd., 32,000 kgs., Rs. 7,54,102.

XYLIDINE : From Belgium : Peico Electronics & Electricals, 2,000 kgs., Rs. 1,32,225.

ZINC ASH (DUST) : From USA : Prince Metal Works, 112.184 MTS., Rs. 5,19,828.

ZINC OXIDE : From Korea : Jalan Wollen Inds., 20,000 kgs., Rs. 2,89,153.

Plastics Materials Imported

BOMBAY
(From 29.12.87 to 4.1.88)

CELLULOSE ACETATE PHTHALATE : From Germany : Bombay Paints & Allied Product, 200 kgs., Rs. 1,16,584/-.

HIGH DENSITY POLYETHYLENE : From Saudi Arabia : Warner Muryeas P. Ltd., 24.700 Mts., Rs. 2,81,202/-.

HIGH DENSITY POLYETHYLENE BLOW MOULDING : From Czechoslavakia: Naresh Paper Bag Co., 12.500 Mts., Rs. 1,02,009/-.

HIGH DENSITY POLYETHYLENE : From U.S A. : Garware Plastics & Polyester Ltd., 15,000 kgs., Rs. 1,83,946.87. From China : Sehgal Knotwears, 51,450 kgs., Rs. 6,19,851/-. From Germany : Siva Chemical Industries, 24.750 Mts., Rs. 2,96,541/-; Prochem Specialists, 24.750 Mts., Rs. 2,96,540/-. From Iraq : Manohar Singh, 54.450 Mts., Rs. 2,06,617/-, Satwant Kaur, 17.150 Mts., Rs. 2,06,617/-.

LINEAR LOW DENSITY POLYETHYLENE : From U.S.A. : Bina Corporation, 24,750 kgs., Rs. 89,202/-.

LOW DENSITY POLYETHYLENE : From Japan : Elec Wel 34 Mts., Rs. 3,82,611/-; From Germany : Chemical Corporation of India, 49.5 Mts., Rs 6,22,571/-; From Italy : Engineers India Ltd., 30 Mts., Rs. 3,57,457/-.

HIGH DENSITY POLYETHLENE MOULDING POWDER : From Singapore : Raheja Mercantile Corporation 16.5 Mts, Rs. 2,22,815/-.

MEDIUM DENSITY POLYETHYLENE : From Germany : Indian Telephone Industries, 45,000 kgs., Rs. 6,55,338/-.

META TOLUENE DIAMINE : From Australia : Shalimar Paints Ltd., 2.0 Mts., Rs. 63,554/-.

POLYBUTENE : From U.S.A. : Savita Chemicals P. Ltd., 12.60 Mts., Rs. 1,20,106/-.

POLYPROPYLENE : From Germany : Khatau Jubker Ltd., 16 Mts., Rs. 2,83,848/-.

PVC RESIN : From Finland : The State Trading Corporation of India, 210 Mts., Rs. 20,40,532/-. From Brazil : Tata Exports Ltd., 15 Mts., Rs. 1,78,318/-.

(From 5.1.88 to 7.1.88)

ACETAL COPOLYMER : From Japan : National Electronic Inds. 5 MTS., Rs. 1,65,489.

LDPE : From UK : Vidhya Telelinks, 9.625 MT., Rs. 1,41,482 ; From Japan : Flach Couriers P. Ltd., 24.75 MTS., Rs. 2,95,629 ; From FRG : Asian Paints (I) Ltd., 48.000 kgs., Rs. 6,62,646 ; From Japan : Tinna Enterprises (P) Ltd., 500 kgs., Rs. 19,197 ; From Japan : Crisana Synthetics P. Ltd., 10.000 MTS., Rs. 1,45,413.

(To be Continued)

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Isobutyl Alcohol
Iso Propyl Alcohol
Lithium Hydroxide
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